

STATE OF NEW HAMPSHIRE

INTER-DEPARTMENT COMMUNICATION

DATE: October 20, 2021

FROM: Andrew O'Sullivan
Wetlands Program Manager

AT (OFFICE): Department of
Transportation

SUBJECT: Dredge & Fill Application
Eaton 43775

Bureau of
Environment

TO: Karl Benedict, Public Works Permitting Officer
New Hampshire Wetlands Bureau
29 Hazen Drive, P.O. Box 95
Concord, NH 03302-0095

Forwarded herewith is the application package prepared by NH DOT District 3 for the subject minor impact project. The project is located along NH Route 153 in the Town of Eaton, NH. The proposed work includes the replacement of the existing 8' wide by 4'-7" high granite block with concrete extensions with an 8' wide by 7' high precast concrete box with 2' of embedment.

This project was reviewed at the Natural Resource Agency Coordination Meeting on July 21, 2021. A copy of the minutes has been included with this application package. A copy of this application and plans can be accessed on the Departments website via the following link: <http://www.nh.gov/dot/org/projectdevelopment/environment/units/program-management/wetland-applications.htm>.

NHDOT anticipates and request that this project be reviewed and permitted by the Army Corp of Engineers through the State Programmatic General Permit process. A copy of the application has been sent to the Army Corp of Engineers.

No Mitigation is required for the proposed work.

The lead people to contact for this project are Samantha Fifield, District 3 (Samantha.Fifield @dot.nh.gov) or Andrew O'Sullivan, Wetlands Program Manager, Bureau of Environment (271-3226 or Andrew.O'Sullivan@dot.nh.gov).

A payment voucher has been processed for this application (Voucher #660120) in the amount of \$400.00.

If and when this application meets with the approval of the Bureau, please send the permit directly to Andrew O'Sullivan, Wetlands Program Manager, Bureau of Environment.

AMO:amo

cc:

BOE Original

Town of Eaton (4 copies via certified mail)

David Trubey, NH Division of Historic Resources (Cultural Review Within)

Carol Henderson, NH Fish & Game (via electronic notification)

Maria Tur, US Fish & Wildlife (via electronic notification)

Beth Alafat & Jeanie Brochi, US Environmental Protection Agency (via electronic notification)

Michael Hicks & Rick Kristoff, US Army Corp of Engineers (via electronic notification)

Kevin Nyhan, BOE (via electronic notification)

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**STANDARD DREDGE AND FILL
WETLANDS PERMIT APPLICATION**
Water Division/Land Resources Management
Wetlands Bureau
[Check the Status of your Application](#)



RSA/Rule: RSA 482-A/Env-Wt 100-900

APPLICANT'S NAME: NH Department of Transportation **TOWN NAME:** EATON

Administrative Use Only	Administrative Use Only	Administrative Use Only	File No.:
			Check No.:
			Amount:
			Initials:

A person may request a waiver of the requirements in Rules Env-Wt 100-900 to accommodate situations where strict adherence to the requirements would not be in the best interest of the public or the environment but is still in compliance with RSA 482-A. A person may also request a waiver of the standards for existing dwellings over water pursuant to RSA 482-A:26, III(b). For more information, please consult the [Waiver Request Form](#).

SECTION 1 - REQUIRED PLANNING FOR ALL PROJECTS (Env-Wt 306.05; RSA 482-A:3, I(d)(2))

Please use the [Wetland Permit Planning Tool \(WPPT\)](#), the Natural Heritage Bureau (NHB) [DataCheck Tool](#), the [Aquatic Restoration Mapper](#), or other sources to assist in identifying key features such as: [priority resource areas \(PRAs\)](#), [protected species or habitats](#), coastal areas, designated rivers, or designated prime wetlands.

Has the required planning been completed?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Does the property contain a PRA? If yes, provide the following information:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<ul style="list-style-type: none"> Does the project qualify for an Impact Classification Adjustment (e.g. NH Fish and Game Department (NHF&G) and NHB agreement for a classification downgrade) or a Project-Type Exception (e.g. Maintenance or Statutory Permit-by-Notification (SPN) project)? See Env-Wt 407.02 and Env-Wt 407.04. 	<input type="checkbox"/> Yes <input type="checkbox"/> No
<ul style="list-style-type: none"> Protected species or habitat? <ul style="list-style-type: none"> If yes, species or habitat name(s): <input type="text"/> NHB Project ID #: <input type="text"/> 	<input type="checkbox"/> Yes <input type="checkbox"/> No
<ul style="list-style-type: none"> Bog? 	<input type="checkbox"/> Yes <input type="checkbox"/> No
<ul style="list-style-type: none"> Floodplain wetland contiguous to a tier 3 or higher watercourse? 	<input type="checkbox"/> Yes <input type="checkbox"/> No
<ul style="list-style-type: none"> Designated prime wetland or duly-established 100-foot buffer? 	<input type="checkbox"/> Yes <input type="checkbox"/> No
<ul style="list-style-type: none"> Sand dune, tidal wetland, tidal water, or undeveloped tidal buffer zone? 	<input type="checkbox"/> Yes <input type="checkbox"/> No
Is the property within a Designated River corridor? If yes, provide the following information:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<ul style="list-style-type: none"> Name of Local River Management Advisory Committee (LAC): <input type="text"/> A copy of the application was sent to the LAC on Month: <input type="text"/> Day: <input type="text"/> Year: <input type="text"/> 	

lrn@des.nh.gov or (603) 271-2147

NHDES Wetlands Bureau, 29 Hazen Drive, PO Box 95, Concord, NH 03302-0095

www.des.nh.gov

For dredging projects, is the subject property contaminated? • If yes, list contaminant: <input type="text"/>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is there potential to impact impaired waters, class A waters, or outstanding resource waters?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
For stream crossing projects, provide watershed size (see WPPT or Stream Stats): <input type="text"/> 1.34 sq mi.	
SECTION 2 - PROJECT DESCRIPTION (Env-Wt 311.04(i))	
Provide a brief description of the project and the purpose of the project, outlining the scope of work to be performed and whether impacts are temporary or permanent. DO NOT reply "See attached"; please use the space provided below.	
<p>The project proposes to replace an existing stone block culvert (96" w x 55" h x 29.5' long) with a precast concrete box culvert (96" w x 84" h x 36' long). The new box culvert will be sunk 24" so that stream bed materials may be placed throughout the culvert's invert. Permanent impacts are associated with widening the crossing to place the proposed culvert's headwalls further away from the pavement and deicing salt. Temporary impacts are associated with construction activities. All construction activities shall closely follow the guidelines provided in "Best Management Practices for Routine Roadway Maintenance Activities in New Hampshire (2019)" for erosion control, and in "Best Management Practices for the Control of Invasive and Noxious Plant Species Manual (2018)" for invasive species control.</p>	
SECTION 3 - PROJECT LOCATION	
Separate wetland permit applications must be submitted for each municipality within which wetland impacts occur.	
ADDRESS: <input type="text"/> NH Route 153	
TOWN/CITY: <input type="text"/> Eaton	
TAX MAP/BLOCK/LOT/UNIT: <input type="text"/> DOT ROW	
US GEOLOGICAL SURVEY (USGS) TOPO MAP WATERBODY NAME: <input type="text"/> No Name Brook <input type="checkbox"/> N/A	
(Optional) LATITUDE/LONGITUDE in decimal degrees (to five decimal places): <input type="text"/> 43.91065° North <input type="text"/> -71.08073° West	

SECTION 4 - APPLICANT (DESIRED PERMIT HOLDER) INFORMATION (Env-Wt 311.04(a))

If the applicant is a trust or a company, then complete with the trust or company information.

NAME: NH Department of Transportation, Samantha Fifield

MAILING ADDRESS: 2 Sawmill Road

TOWN/CITY: Gilford

STATE: NH

ZIP CODE: 03249

EMAIL ADDRESS: samantha.d.fifield@dot.nh.gov

FAX:

PHONE: 524-6667

ELECTRONIC COMMUNICATION: By initialing here: SDF, I hereby authorize NHDES to communicate all matters relative to this application electronically.

SECTION 5 - AUTHORIZED AGENT INFORMATION (Env-Wt 311.04(c))

☐ N/A

LAST NAME, FIRST NAME, M.I.:

COMPANY NAME:

MAILING ADDRESS:

TOWN/CITY:

STATE:

ZIP CODE:

EMAIL ADDRESS:

FAX:

PHONE:

ELECTRONIC COMMUNICATION: By initialing here: , I hereby authorize NHDES to communicate all matters relative to this application electronically.

SECTION 6 - PROPERTY OWNER INFORMATION (IF DIFFERENT THAN APPLICANT) (Env-Wt 311.04(b))

If the owner is a trust or a company, then complete with the trust or company information.

☐ Same as applicant

NAME: NH Department of Transportation, Andrew O' Sullivan

MAILING ADDRESS: 7 Haen Drive; PO Box 483

TOWN/CITY: Concord

STATE: NH

ZIP CODE: 03302

EMAIL ADDRESS: andrew.O'Sullivan@dot.nh.gov

FAX: 271-7199

PHONE: 271-3226

ELECTRONIC COMMUNICATION: By initialing here: AMO, I hereby authorize NHDES to communicate all matters relative to this application electronically.

SECTION 7 - RESOURCE-SPECIFIC CRITERIA ESTABLISHED IN Env-Wt 400, Env-Wt 500, Env-Wt 600, Env-Wt 700, OR Env-Wt 900 HAVE BEEN MET (Env-Wt 313.01(a)(3))

Describe how the resource-specific criteria have been met for each chapter listed above (please attach information about stream crossings, coastal resources, prime wetlands, or non-tidal wetlands and surface waters):

Env-Wt 400: The wetlands and waterway features were delineated and classified by Sarah Large and Deidra Benjamin on 6/1/2021 in accordance with Env-Wt 406. Temp and permanent impacts are to Riverine Lower perennial Unconsolidated Bottom Cobble-gravel/Sand (R2UB12) and banks.

Env-Wt 500: If impacted, banks shall be stabilized according to Env-Wt 514. Project is maintenance of a public highway under Env-Wt 527.

Env-Wt 600: The project is not located on the coast.

Env-Wt 700: The project area does not impact a prime wetland or regulatory prime wetland buffer.

Env-Wt 900: This project qualifies under Env-Wt 904.09 as the existing crossing does not have a history of overtopping the roadway and the proposed new culvert:

- Meets the general criteria specified in Env-Wt 904.01;
- Maintains the hydraulic capacity of the stream crossing;
- Maintains the capacity of the crossing to accommodate aquatic organism passage;
- Maintains the connectivity of the stream reaches upstream and downstream of the crossing;
- Does not contribute to increases in the frequency of flooding or overtopping the banks upstream or downstream of the crossing.

The project does require an Alteration in Design, due to Env-Wt 904.07 (C) (2), as it does not pass the theoretical 100 year storm. However, the proposed culvert does pass all recorded storms with flood events.

SECTION 8 - AVOIDANCE AND MINIMIZATION

Impacts within wetland jurisdiction must be avoided to the maximum extent practicable (Env-Wt 313.03(a)).* Any project with unavoidable jurisdictional impacts must then be minimized as described in the [Wetlands Best Management Practice Techniques For Avoidance and Minimization](#) and the [Wetlands Permitting: Avoidance, Minimization and Mitigation Fact Sheet](#). For minor or major projects, a functional assessment of all wetlands on the project site is required (Env-Wt 311.03(b)(10)).*

Please refer to the application checklist to ensure you have attached all documents related to avoidance and minimization, as well as functional assessment (where applicable). Use the [Avoidance and Minimization Checklist](#), the [Avoidance and Minimization Narrative](#), or your own avoidance and minimization narrative.

**See Env-Wt 311.03(b)(6) and Env-Wt 311.03(b)(10) for shoreline structure exemptions.*

SECTION 9 - MITIGATION REQUIREMENT (Env-Wt 311.02)

If unavoidable jurisdictional impacts require mitigation, a mitigation [pre-application meeting](#) must occur at least 30 days but not more than 90 days prior to submitting this Standard Dredge and Fill Permit Application.

Mitigation Pre-Application Meeting Date: Month: **7** Day: **21** Year: **2021**

☒ N/A - Mitigation is not required

SECTION 10 - THE PROJECT MEETS COMPENSATORY MITIGATION REQUIREMENTS (Env-Wt 313.01(a)(1)c)

Confirm that you have submitted a compensatory mitigation proposal that meets the requirements of Env-Wt 800 for all permanent unavoidable impacts that will remain after avoidance and minimization techniques have been exercised to the maximum extent practicable: ☒ I confirm submittal.

☒ N/A – Compensatory mitigation is not required

SECTION 11 - IMPACT AREA (Env-Wt 311.04(g))

For each jurisdictional area that will be/has been impacted, provide square feet (SF) and, if applicable, linear feet (LF) of impact, and note whether the impact is after-the-fact (ATF; i.e., work was started or completed without a permit).

For intermittent and ephemeral streams, the linear footage of impact is measured along the thread of the channel. *Please note, installation of a stream crossing in an ephemeral stream may be undertaken without a permit per Rule Env-Wt 309.02(d), however other dredge or fill impacts should be included below.*

For perennial streams/ivers, the linear footage of impact is calculated by summing the lengths of disturbances to the channel and banks.

Permanent impacts are impacts that will remain after the project is complete (e.g., changes in grade or surface materials).

Temporary impacts are impacts not intended to remain (and will be restored to pre-construction conditions) after the project is completed.

JURISDICTIONAL AREA		PERMANENT			TEMPORARY		
		SF	LF	ATF	SF	LF	ATF
Wetlands	Forested Wetland			<input type="checkbox"/>			<input type="checkbox"/>
	Scrub-shrub Wetland			<input type="checkbox"/>			<input type="checkbox"/>
	Emergent Wetland			<input type="checkbox"/>			<input type="checkbox"/>
	Wet Meadow			<input type="checkbox"/>			<input type="checkbox"/>
	Vernal Pool			<input type="checkbox"/>			<input type="checkbox"/>
	Designated Prime Wetland			<input type="checkbox"/>			<input type="checkbox"/>
	Duly-established 100-foot Prime Wetland Buffer			<input type="checkbox"/>			<input type="checkbox"/>
Surface Water	Intermittent / Ephemeral Stream			<input type="checkbox"/>			<input type="checkbox"/>
	Perennial Stream or River	61	12.3	<input type="checkbox"/>	123.7	14.5	<input type="checkbox"/>
	Lake / Pond			<input type="checkbox"/>			<input type="checkbox"/>
	Docking - Lake / Pond			<input type="checkbox"/>			<input type="checkbox"/>
	Docking - River			<input type="checkbox"/>			<input type="checkbox"/>
Banks	Bank - Intermittent Stream			<input type="checkbox"/>			<input type="checkbox"/>
	Bank - Perennial Stream / River	41	15.8	<input type="checkbox"/>	112.7	26.6	<input type="checkbox"/>
	Bank / Shoreline - Lake / Pond			<input type="checkbox"/>			<input type="checkbox"/>
Tidal	Tidal Waters			<input type="checkbox"/>			<input type="checkbox"/>
	Tidal Marsh			<input type="checkbox"/>			<input type="checkbox"/>
	Sand Dune			<input type="checkbox"/>			<input type="checkbox"/>
	Undeveloped Tidal Buffer Zone (TBZ)			<input type="checkbox"/>			<input type="checkbox"/>
	Previously-developed TBZ			<input type="checkbox"/>			<input type="checkbox"/>
	Docking - Tidal Water			<input type="checkbox"/>			<input type="checkbox"/>
TOTAL		102	28.1		236.4	41.1	

SECTION 12 - APPLICATION FEE (RSA 482-A:3, I)

☐ **MINIMUM IMPACT FEE:** Flat fee of \$400.

☐ **NON-ENFORCEMENT RELATED, PUBLICLY-FUNDED AND SUPERVISED RESTORATION PROJECTS, REGARDLESS OF IMPACT CLASSIFICATION:** Flat fee of \$400 (refer to RSA 482-A:3, 1(c) for restrictions).

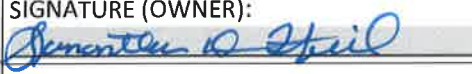
☒ **MINOR OR MAJOR IMPACT FEE:** Calculate using the table below:

Permanent and temporary (non-docking):	338.4 SF	×	\$0.40 =	\$ 135.36
Seasonal docking structure:	SF	×	\$2.00 =	\$
Permanent docking structure:	SF	×	\$4.00 =	\$
Projects proposing shoreline structures (including docks) add \$400 =				\$
Total =				\$ 400

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The application fee for minor or major impact is the above calculated total or \$400, whichever is greater = \$		
SECTION 13 - PROJECT CLASSIFICATION (Env-Wt 306.05) Indicate the project classification.		
<input type="checkbox"/> Minimum Impact Project	<input checked="" type="checkbox"/> Minor Project	<input type="checkbox"/> Major Project
SECTION 14 - REQUIRED CERTIFICATIONS (Env-Wt 311.11)		
Initial each box below to certify:		
Initials: SDF <div style="border: 1px solid black; width: 40px; height: 20px; margin: 2px;"></div> <div style="border: 1px solid black; width: 40px; height: 20px; margin: 2px;"></div>	To the best of the signer's knowledge and belief, all required notifications have been provided.	
Initials: SDF <div style="border: 1px solid black; width: 40px; height: 20px; margin: 2px;"></div> <div style="border: 1px solid black; width: 40px; height: 20px; margin: 2px;"></div>	The information submitted on or with the application is true, complete, and not misleading to the best of the signer's knowledge and belief.	
Initials: SDF <div style="border: 1px solid black; width: 40px; height: 20px; margin: 2px;"></div> <div style="border: 1px solid black; width: 40px; height: 20px; margin: 2px;"></div>	The signer understands that: <ul style="list-style-type: none"> The submission of false, incomplete, or misleading information constitutes grounds for NHDES to: <ol style="list-style-type: none"> Deny the application. Revoke any approval that is granted based on the information. If the signer is a certified wetland scientist, licensed surveyor, or professional engineer licensed to practice in New Hampshire, refer the matter to the joint board of licensure and certification established by RSA 310-A:1. The signer is subject to the penalties specified in New Hampshire law for falsification in official matters, currently RSA 641. The signature shall constitute authorization for the municipal conservation commission and the Department to inspect the site of the proposed project, except for minimum impact forestry SPN projects and minimum impact trail projects, where the signature shall authorize only the Department to inspect the site pursuant to RSA 482-A:6, II. 	
Initials: <div style="border: 1px solid black; width: 40px; height: 20px; margin: 2px;"></div> <div style="border: 1px solid black; width: 40px; height: 20px; margin: 2px;"></div> <div style="border: 1px solid black; width: 40px; height: 20px; margin: 2px;"></div>	If the applicant is not the owner of the property, each property owner signature shall constitute certification by the signer that he or she is aware of the application being filed and does not object to the filing.	
SECTION 15 - REQUIRED SIGNATURES (Env-Wt 311.04(d); Env-Wt 311.11)		
SIGNATURE (OWNER): 	PRINT NAME LEGIBLY: SAMANTHA D FIFIELD	DATE: 10-11-21
SIGNATURE (APPLICANT, IF DIFFERENT FROM OWNER): <div style="border: 1px solid black; width: 280px; height: 20px;"></div>	PRINT NAME LEGIBLY: <div style="border: 1px solid black; width: 100px; height: 20px;"></div>	DATE: <div style="border: 1px solid black; width: 60px; height: 20px;"></div>
SIGNATURE (AGENT, IF APPLICABLE): <div style="border: 1px solid black; width: 280px; height: 20px;"></div>	PRINT NAME LEGIBLY: <div style="border: 1px solid black; width: 100px; height: 20px;"></div>	DATE: <div style="border: 1px solid black; width: 60px; height: 20px;"></div>
SECTION 16 - TOWN / CITY CLERK SIGNATURE (Env-Wt 311.04(f))		
As required by RSA 482-A:3, I(a)(1), I hereby certify that the applicant has filed four application forms, four detailed plans, and four USGS location maps with the town/city indicated below.		
TOWN/CITY CLERK SIGNATURE: <div style="border: 1px solid black; width: 280px; height: 20px;"></div>	PRINT NAME LEGIBLY: Exempt, State Agency per RSA 482-A:31(a)(1)	

TOWN/CITY: <input type="text"/>	DATE: <input type="text"/>
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DIRECTIONS FOR TOWN/CITY CLERK:

Per RSA 482-A:3, I(a)(1)

1. IMMEDIATELY sign the original application form and four copies in the signature space provided above.
2. Return the signed original application form and attachments to the applicant so that the applicant may submit the application form and attachments to NHDES by mail or hand delivery.
3. IMMEDIATELY distribute a copy of the application with one complete set of attachments to each of the following bodies: the municipal Conservation Commission, the local governing body (Board of Selectmen or Town/City Council), and the Planning Board.
4. Retain one copy of the application form and one complete set of attachments and make them reasonably accessible for public review.

DIRECTIONS FOR APPLICANT:

Submit the original permit application form bearing the signature of the Town/City Clerk, additional materials, and the application fee to NHDES by mail or hand delivery at the address at the bottom of this page. Make check or money order payable to "Treasurer – State of NH".

Keep this checklist for your reference; do not submit with your application.

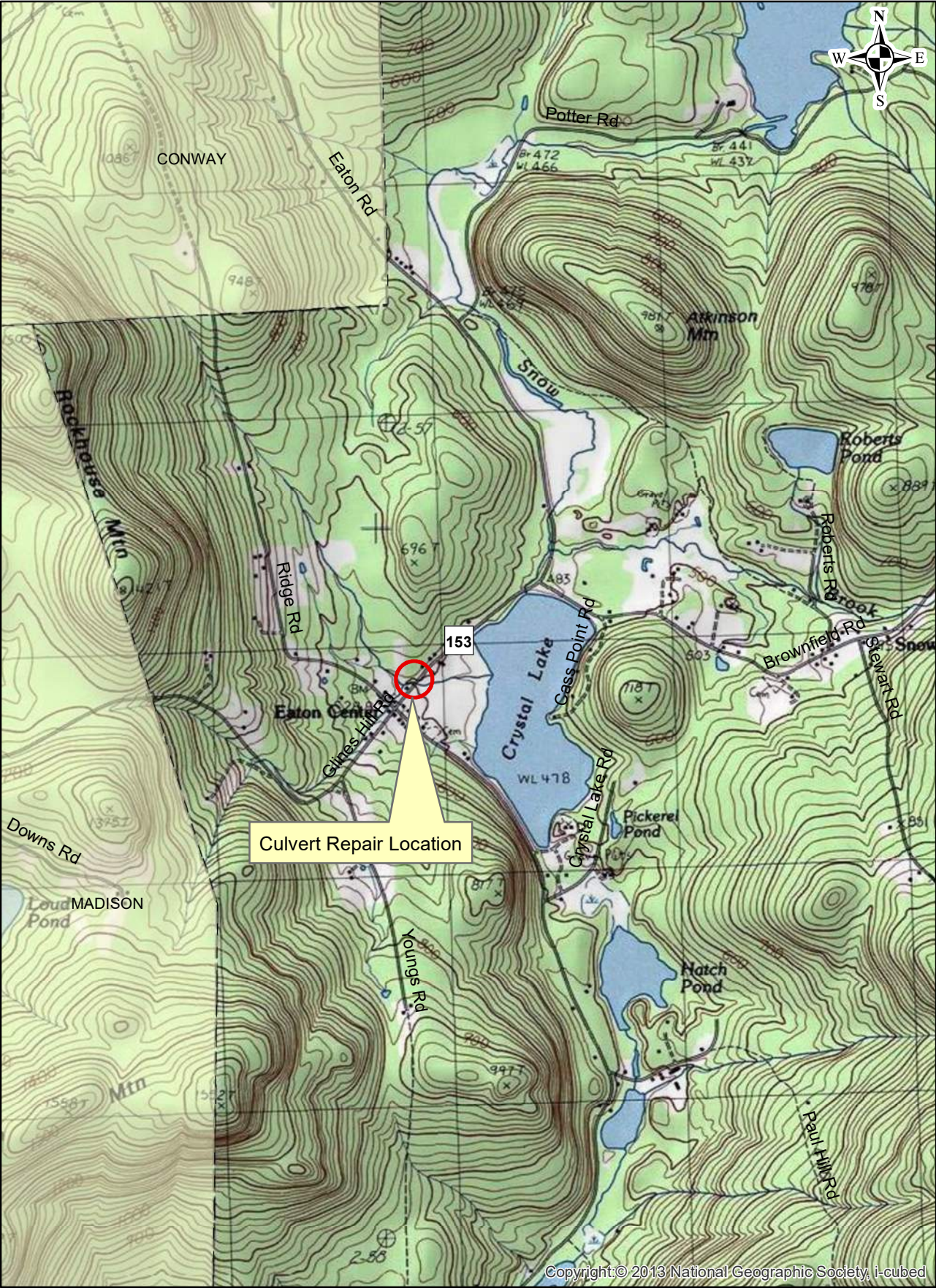
APPLICATION CHECKLIST

Unless specified, all items below are required. Failure to provide the required items will delay a decision on your project and may result in denial of your application. Please reference statute RSA 482-A, Fill and Dredge in Wetlands, and the [Wetland Rules Env-Wt 100-900](#).

- ☒ The completed, dated, signed, and certified application (Env-Wt 311.03(b)(1)).
- ☒ Correct fee as determined in RSA 482-A:3, I(b) or (c), subject to any cap established by RSA 482-A:3, X (Env-Wt 311.03(b)(2)). Make check or money order payable to "Treasurer – State of NH".
- ☒ The Required Planning actions required by Env-Wt 311.01(a)-(c) and Env-Wt 311.03(b)(3).
- ☐ [US Army Corps of Engineers \(ACE\) "Appendix B, New Hampshire General Permits \(GPs\), Required Information and Corps Secondary Impacts Checklist"](#) and its required attachments (Env-Wt 307.02). This includes the [US Fish and Wildlife Service IPAC review](#) and [Section 106 Historic/Archaeological Resource review](#).
- ☒ Project plans described in Env-Wt 311.05 (Env-Wt 311.03(b)(4)).
- ☒ Maps, or electronic shape files and meta data, and other attachments specified in Env-Wt 311.06 (Env-Wt 311.03(b)(5)).
- ☒ Explanation of the methods, timing, and manner as to how the project will meet standard permit conditions required in Env-Wt 307 (Env-Wt 311.03(b)(7)).
- ☒ If applicable, the information regarding proposed compensatory mitigation specified in Env-Wt 311.08 and Chapter Env-Wt 800 - [Permittee Responsible Mitigation Project Worksheet](#), unless not required under Env-Wt 313.04 (Env-Wt 311.03(b)(8); Env-Wt 311.08; Env-Wt 313.04).
- ☒ Any additional information specific to the **type of resource** as specified in Env-Wt 311.09 (Env-Wt 311.03(b)(9); Env-Wt 311.04(j)).
- ☒ Project specific information required by Env-Wt 500, Env-Wt 600, and Env-Wt 900 (Env-Wt 311.03(b)(11)).
- ☐ A list containing the name, mailing address and tax map/lot number of each abutter to the subject property (Env-Wt 311.03(b)(12)).
- ☒ Copies of certified postal receipts or other proof of receipt of the notices that are required by RSA 482-A:3, I(d) (Env-Wt 311.03(b)(13)).
- ☒ Project design considerations required by Env-Wt 313 (Env-Wt 311.04(j)).
- ☒ Town tax map showing the subject property, the location of the project on the property, and the location of properties of abutters with each lot labeled with the name and mailing address of the abutter (Env-Wt 311.06(a)).
- ☒ Dated and labeled color photographs that:
 - (1) Clearly depict:
 - a. All jurisdictional areas, including but not limited to portions of wetland, shoreline, or surface water where impacts have or are proposed to occur.
 - b. All existing shoreline structures.
 - (2) Are mounted or printed no more than 2 per sheet on 8.5 x 11 inch sheets (Env-Wt 311.06(b)).
- ☒ A copy of the appropriate US Geological Survey map or updated data based on LiDAR at a scale of one inch equals 2,000 feet showing the location of the subject property and proposed project (Env-Wt 311.06(c)).
- ☒ A narrative that describes the work sequence, including pre-construction through post-construction, and the relative timing and progression of all work (Env-Wt 311.06(d)).

- ☐ For all projects in the protected tidal zone, a copy of the recorded deed with book and page numbers for the property (Env-Wt 311.06(e)).
 - ☐ If the applicant is not the owner in fee of the subject property, documentation of the applicant's legal interest in the subject property, provided that for utility projects in a utility corridor, such documentation may comprise a list that:
 - (1) Identifies the county registry of deeds and book and page numbers of all of the easements or other recorded instruments that provide the necessary legal interest; and
 - (2) Has been certified as complete and accurate by a knowledgeable representative of the applicant (Env-Wt 311.06(f)).
 - ☒ The NHB memo containing the NHB identification number and results as well as any written follow-up communications such as additional memos or email communications with either NHB or NHF&G (Env-Wt 311.06(g)). See [Wetlands Permitting: Protected Species and Habitat Fact Sheet](#).
 - ☒ A statement of whether the applicant has received comments from the local conservation commission and, if so, how the applicant has addressed the comments (Env-Wt 311.06(h)).
 - ☐ For projects in LAC jurisdiction, a statement of whether the applicant has received comments from the LAC and, if so, how the applicant has addressed the comments (Env-Wt 311.06(i)).
 - ☒ If the applicant is also seeking to be covered by the state general permits, a statement of whether comments have been received from any federal agency and, if so, how the applicant has addressed the comments (Env-Wt 311.06(j)).
 - ☒ [Avoidance and Minimization Written Narrative](#) or the [Avoidance and Minimization Checklist](#), or your own avoidance and minimization narrative (Env-Wt 311.07).
 - ☐ For after-the-fact applications: information required by Env-Wt 311.12.
 - ☐ [Coastal Resource Worksheet](#) for coastal projects as required under Env-Wt 600.
 - ☐ Prime Wetlands information required under Env-Wt 700. See [WPPT](#) for prime wetland mapping.
- Required Attachments for Minor and Major Projects**
- ☒ [Attachment A: Minor and Major Projects](#) (Env-Wt 313.03).
 - ☐ [Functional Assessment Worksheet](#) or others means of documenting the results of actions required by Env-Wt 311.10 as part of an application preparation for a standard permit (Env-Wt 311.03(b)(3); Env-Wt 311.03(b)(10)). See [Functional Assessments for Wetlands and Other Aquatic Resources Fact Sheet](#). For shoreline structures, see shoreline structures exemption in Env-Wt 311.03(b)(10)).
- Optional Materials**
- ☒ [Stream Crossing Worksheet](#) which summarizes the requirements for stream crossings under Env-Wt 900.
 - ☐ Request for [concurrent processing of related shoreland / wetlands permit applications](#) (Env-Wt 313.05).

Eaton 1382H-1
NH Route 153 over Unnamed Brook



0 0.25 0.5 1 Miles

1:24,000



STANDARD DREDGE AND FILL WETLANDS PERMIT APPLICATION ATTACHMENT A: MINOR AND MAJOR PROJECTS



Water Division/Land Resources Management

Wetlands Bureau

[Check the Status of your Application](#)

RSA/ Rule: RSA 482-A/ Env-Wt 311.10; Env-Wt 313.01(a)(1); Env-Wt 313.03

APPLICANT'S NAME: NH Department of Transportation **TOWN NAME:** Eaton

Attachment A is required for *all minor and major projects*, and must be completed *in addition* to the [Avoidance and Minimization Narrative](#) or [Checklist](#) that is required by Env-Wt 307.11.

For projects involving construction or modification of non-tidal shoreline structures over areas of surface waters having an absence of wetland vegetation, only Sections I.X through I.XV are required to be completed.

PART I: AVOIDANCE AND MINIMIZATION

In accordance with Env-Wt 313.03(a), the Department shall not approve any alteration of any jurisdictional area unless the applicant demonstrates that the potential impacts to jurisdictional areas have been avoided to the maximum extent practicable and that any unavoidable impacts have been minimized, as described in the [Wetlands Best Management Practice Techniques For Avoidance and Minimization](#).

SECTION I.I - ALTERNATIVES (Env-Wt 313.03(b)(1))

Describe how there is no practicable alternative that would have a less adverse impact on the area and environments under the Department's jurisdiction.

REHABILITATE EXISTING CULVERT: THIS OPTION WAS INITIALLY CONSIDERED AND PERMIT SECURED. SINCE THAT TIME THE CROSSING HAS DETERIORATED TO SUCH A DEGREE THAT REHAB IS NO LONGER AN OPTION.

REPLACEMENT(16' SPAN): BASED ON THE CONCLUSIONS OF THE STREAM CROSSING GUIDELINES A FULLY COMPLIANT STRUCTURE IS 16' WIDE. THIS OPTION IS OUTSIDE THE DEPARTMENTS ABILITY TO CONSTRUCT WITH DISTRICT FORCES AS WELL AS OUTSIDE BUDGETORY CONSTRAINTS FOR THE REPLACEMENT.

REPLACEMENT (36' LONG X 8' WIDE X 7' TALL): THIS IS THE PREFERRED ALTERNATIVE. THIS OPTION IS WITHIN THE ABILITY OF DISTRICT TO CONSTRUCT AS WELL AS BUDGETORY CONSTRAINTS. THIS DESIGN WILL PASS THE 50-YEAR STORM AND WILL MAINTAIN AQUATIC ORGANISM PASSAGE WITH THE USE OF STREAM SIMULATION THROUGH THE STRUCTURE.

SECTION I.II - MARSHES (Env-Wt 313.03(b)(2))

Describe how the project avoids and minimizes impacts to tidal marshes and non-tidal marshes where documented to provide sources of nutrients for finfish, crustacean, shellfish, and wildlife of significant value.

No tidal or non-tidal marshes will be impacted as part of this project.

SECTION I.III - HYDROLOGIC CONNECTION (Env-Wt 313.03(b)(3))

Describe how the project maintains hydrologic connections between adjacent wetland or stream systems.

The culvert replacement will maintain the hydraulic connection of the stream. Streambed simulation will be placed within the precast box.

SECTION I.IV - JURISDICTIONAL IMPACTS (Env-Wt 313.03(b)(4))

Describe how the project avoids and minimizes impacts to wetlands and other areas of jurisdiction under RSA 482-A, especially those in which there are exemplary natural communities, vernal pools, protected species and habitat, documented fisheries, and habitat and reproduction areas for species of concern, or any combination thereof.

THE PROJECT HAS BEEN DESIGNED IN ACCORDANCE WITH ENV-WT 400, 500 AND 900. IMPACTS TO WETLAND RESOURCES HAVE BEEN MINIMIZED TO THE EXTENT PRACTICABLE. IMPACTS TO THE UPPER PERENNIAL RIVERINE SYSTEM ARE LIMITED TO AREAS NEEDED TO CONSTRUCT THE REPLACEMENT STRUCTURE. THERE ARE NO KNOWN EXEMPLARY NATURAL COMMUNITIES, VERNAL POOLS OR PROTECTED SPECIES OR HABITAT KNOWN TO OCCUR IN THE PROJECT AREA. A REVIEW OF THE NATURAL HERITAGE BUREAU DATABASE SERACH (NHB21-0911) DETERMINED THERE ARE NO RECORDED OCCURANCES IN THE PROJECT AREA. REVIEW OF THE USFWS SPECIES LIST DETERMINED THE NORTHERN LONG-EARED BAT AND SMALL WHORLED POGONIA HAVE POTENTIAL TO OCCUR IN THE PROJECT AREA. FURTHER COORDINATION DETERMINED ANY TAKE OF THE NORTHERN LONG-EARED BAT THAT MAY OCCUR IS NOT PROHIBITED UNDER THE 4(D) RULE OF THE ENDANGERED SPECIES ACT. A FIELD REVIEW FOR SMALL WHORLED POGONIA DETERMINED NO SPECIES PRESENT WITHIN THE PROJECT AREA.

UN-NAMED STREAM IS A PREDICTED COLD WATER FISHERY WITH NO DOCUMENTED RARE OR LISTED SPECIES OR REPRODUCTION AREAS ARE KNOWN TO OCCUR IN THE PROJECT AREA. STOCKED BROWN TROUT OCCURS IN CRYSTAL LAKE. NHDOT IS NOT ANTICIPATING A TIME OF YEAR RESTRICTION AS NO SPECIES UNDER THIS PROTECTION WILL BE IMPACTED. WORK WILL BE DONE DURING LOW FLOW AND LIMITED TO TIME NEEDED TO CONSTRUCT THE REPLACEMENT.

SECTION I.V - PUBLIC COMMERCE, NAVIGATION, OR RECREATION (Env-Wt 313.03(b)(5))

Describe how the project avoids and minimizes impacts that eliminate, depreciate or obstruct public commerce, navigation, or recreation.

TRAFFIC WILL BE LIMITED TO TWO-WAY ALTERNATING TRAFFIC WHILE CONSTRUCTION IS ONGOING. ONCE COMPLETE TRAFFIC WILL RESUME AS NORMAL. NO IMPACTS TO TRAVEL VIA WATERWAY ARE ANTICIPATED, AND NO PUBLIC RECREATION FACILITIES ARE KNOWN TO OCCUR AT THE PROJECT LOCATION.

SECTION I.VI - FLOODPLAIN WETLANDS (Env-Wt 313.03(b)(6))

Describe how the project avoids and minimizes impacts to floodplain wetlands that provide flood storage.

THE PROJECT IS LOCATED WITHIN A MAPPED 100-YEAR FEMA FLOODPLAIN. A HYDRAULIC ANALYSIS HAS DETERMINED THE REPLACEMENT CULVERT WIL PASS A 50-YEAR STORM EVENT, AN IMPROVEMENT FROM CURRENT CONDITIONS. THE CROSSING DOES NOT HAVE A HISTORY OF FLOODING. NO IMPACTS TO FLOODPLAIN WETLANDS ARE PROPOSED.

SECTION I.VII - RIVERINE FORESTED WETLAND SYSTEMS AND SCRUB-SHRUB – MARSH COMPLEXES (Env-Wt 313.03(b)(7))

Describe how the project avoids and minimizes impacts to natural riverine forested wetland systems and scrub-shrub – marsh complexes of high ecological integrity.

NO IMPACTS TO RIVERINE FORESTED WETLAND SYSTEMS OR SCRUB-SHRUB MARSH COMPLEX OF HIGH ECOLOGICAL INTEGRITY ARE PROPOSED.

SECTION I.VIII - DRINKING WATER SUPPLY AND GROUNDWATER AQUIFER LEVELS (Env-Wt 313.03(b)(8))

Describe how the project avoids and minimizes impacts to wetlands that would be detrimental to adjacent drinking water supply and groundwater aquifer levels.

THE PROJECT WILL HAVE NO EFFECT ON WETLANDS THAT WOULD BE DETRIMENTAL TO ADJACENT DRINKING WATER SUPPLY OR GROUNDWATER AQUIFER LEVELS.

SECTION I.IX - STREAM CHANNELS (Env-Wt 313.03(b)(9))

Describe how the project avoids and minimizes adverse impacts to stream channels and the ability of such channels to handle runoff of waters.

THE PROJECT MINIMIZES IMPACTS TO THE STREAM CHANNEL NECESSARY FOR REPLACEMENT OF THE STRUCTURE AND INSTALLATION AND MAINTENANCE OF EROSION CONTROL MEASURES THROUGHOUT CONSTRUCTION. THE PROPOSED STRUCTURE WILL INSTALL STREAMBED SIMULATION THROUGH THE STRUCTURE. THE PROPOSED STRUCTURE WILL IMPROVE THE HYDRAULIC CAPACITY FROM EXISTING, ALLOWING IT TO BETTER HANDLE RUNOFF WATERS.

SECTION I.X - SHORELINE STRUCTURES - CONSTRUCTION SURFACE AREA (Env-Wt 313.03(c)(1))

Describe how the project has been designed to use the minimum construction surface area over surface waters necessary to meet the stated purpose of the structures.

NO SHORELINE STRUCTURES ARE PROPOSED

SECTION I.XI - SHORELINE STRUCTURES - LEAST INTRUSIVE UPON PUBLIC TRUST (Env-Wt 313.03(c)(2))

Describe how the type of construction proposed is the least intrusive upon the public trust that will ensure safe docking on the frontage.

NO SHORELINE STRUCTURES ARE PROPOSED

SECTION I.XII - SHORELINE STRUCTURES – ABUTTING PROPERTIES (Env-Wt 313.03(c)(3))

Describe how the structures have been designed to avoid and minimize impacts on ability of abutting owners to use and enjoy their properties.

NO SHORELINE STRUCTURES ARE PROPOSED

SECTION I.XIII - SHORELINE STRUCTURES – COMMERCE AND RECREATION (Env-Wt 313.03(c)(4))

Describe how the structures have been designed to avoid and minimize impacts to the public's right to navigation, passage, and use of the resource for commerce and recreation.

NO SHORELINE STRUCTURES ARE PROPOSED

SECTION I.XIV - SHORELINE STRUCTURES – WATER QUALITY, AQUATIC VEGETATION, WILDLIFE AND FINFISH HABITAT (Env-Wt 313.03(c)(5))

Describe how the structures have been designed, located, and configured to avoid impacts to water quality, aquatic vegetation, and wildlife and finfish habitat.

NO SHORELINE STRUCTURES ARE PROPOSED

SECTION I.XV - SHORELINE STRUCTURES – VEGETATION REMOVAL, ACCESS POINTS, AND SHORELINE STABILITY (Env-Wt 313.03(c)(6))

Describe how the structures have been designed to avoid and minimize the removal of vegetation, the number of access points through wetlands or over the bank, and activities that may have an adverse effect on shoreline stability.

NO SHORELINE STRUCTURES ARE PROPOSED

PART II: FUNCTIONAL ASSESSMENT
REQUIREMENTS Ensure that project meets the requirements of Env-Wt 311.10 regarding functional assessment (Env-Wt 311.04(j); Env-Wt 311.10).
FUNCTIONAL ASSESSMENT METHOD USED: A STREAM ASSESSMENT WAS CONDUCTED USING THE ARMY CORP HIGHWAY METHODOLOGY
NAME OF CERTIFIED WETLAND SCIENTIST (FOR NON-TIDAL PROJECTS) OR QUALIFIED COASTAL PROFESSIONAL (FOR TIDAL PROJECTS) WHO COMPLETED THE ASSESSMENT: SARAH LARGE
DATE OF ASSESSMENT: 5/22/2016
Check this box to confirm that the application includes a NARRATIVE ON FUNCTIONAL ASSESSMENT: <input checked="" type="checkbox"/>
<p>For minor or major projects requiring a standard permit without mitigation, the applicant shall submit a wetland evaluation report that includes completed checklists and information demonstrating the RELATIVE FUNCTIONS AND VALUES OF EACH WETLAND EVALUATED. Check this box to confirm that the application includes this information, if applicable:</p> <input type="checkbox"/> <p>Note: The Wetlands Functional Assessment worksheet can be used to compile the information needed to meet functional assessment requirements.</p>



AVOIDANCE AND MINIMIZATION CHECKLIST

Water Division/Land Resources Management Wetlands Bureau

[Check the Status of your Application](#)



RSA/Rule: RSA 482-A/ Env-Wt 311.07(c)

This checklist can be used in lieu of the written narrative required by Env-Wt 311.07(a) to demonstrate compliance with requirements for Avoidance and Minimization (A/M), pursuant to RSA 482-A:1 and Env-Wt 311.07(c).

For the construction or modification of non-tidal shoreline structures over areas of surface waters without wetland vegetation, complete only Sections 1, 2, and 4 (or the applicable sections in [Attachment A: Minor and Major Projects \(NHDES-W-06-013\)](#)).

The following definitions and abbreviations apply to this worksheet:

- “A/M BMPs” stands for [Wetlands Best Management Practice Techniques for Avoidance and Minimization](#) dated 2019, published by the New England Interstate Water Pollution Control Commission (Env-Wt 102.18).
- “Practicable” means available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes (Env-Wt 103.62).

SECTION 1 - CONTACT/LOCATION INFORMATION

APPLICANT LAST NAME, FIRST NAME, M.I.: NHDOT Highway Maintenance District 3

PROJECT STREET ADDRESS: NH Route 153

PROJECT TOWN: Eaton

TAX MAP/LOT NUMBER: NA

SECTION 2 - PRIMARY PURPOSE OF THE PROJECT

Env-Wt 311.07(b)(1)

Indicate whether the primary purpose of the project is to construct a water-access structure or requires access through wetlands to reach a buildable lot or the buildable portion thereof.

☐ Yes ☒ No

If you answered “no” to this question, describe the purpose of the “non-access” project type you have proposed:

This is a culvert replacement project.

lrn@des.nh.gov or (603) 271-2147

NHDES Wetlands Bureau, 29 Hazen Drive, PO Box 95, Concord, NH 03302-0095

www.des.nh.gov

SECTION 3 - A/M PROJECT DESIGN TECHNIQUES

Check the appropriate boxes below in order to demonstrate that these items have been considered in the planning of the project. Use N/A (not applicable) for each technique that is not applicable to your project.

Env-Wt 311.07(b)(2)	For any project that proposes new permanent impacts of more than one acre or that proposes new permanent impacts to a Priority Resource Area (PRA), or both, whether any other properties reasonably available to the applicant, whether already owned or controlled by the applicant or not, could be used to achieve the project's purpose without altering the functions and values of any jurisdictional area, in particular wetlands, streams, and PRAs.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
Env-Wt 311.07(b)(3)	Whether alternative designs or techniques, such as different layouts, construction sequencing, or alternative technologies could be used to avoid impacts to jurisdictional areas or their functions and values.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
Env-Wt 311.07(b)(4) Env-Wt 311.10(c)(1) Env-Wt 311.10(c)(2)	The results of the functional assessment required by Env-Wt 311.03(b)(10) were used to select the location and design for the proposed project that has the least impact to wetland functions.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
Env-Wt 311.07(b)(4) Env-Wt 311.10(c)(3)	Where impacts to wetland functions are unavoidable, the proposed impacts are limited to the wetlands with the least valuable functions on the site while avoiding and minimizing impacts to the wetlands with the highest and most valuable functions.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
Env-Wt 313.01(c)(1) Env-Wt 313.01(c)(2) Env-Wt 313.03(b)(1)	No practicable alternative would reduce adverse impact on the area and environments under the department's jurisdiction and the project will not cause random or unnecessary destruction of wetlands.	<input checked="" type="checkbox"/> Check <input type="checkbox"/> N/A
Env-Wt 313.01(c)(3)	The project would not cause or contribute to the significant degradation of waters of the state or the loss of any PRAs.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
Env-Wt 313.03(b)(3) Env-Wt 904.07(c)(8)	The project maintains hydrologic connectivity between adjacent wetlands or stream systems.	<input checked="" type="checkbox"/> Check <input type="checkbox"/> N/A
Env-Wt 311.10 A/M BMPs	Buildings and/or access are positioned away from high function wetlands or surface waters to avoid impact.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
Env-Wt 311.10 A/M BMPs	The project clusters structures to avoid wetland impacts.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
Env-Wt 311.10 A/M BMPs	The placement of roads and utility corridors avoids wetlands and their associated streams.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
A/M BMPs	The width of access roads or driveways is reduced to avoid and minimize impacts. Pullouts are incorporated in the design as needed.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
A/M BMPs	The project proposes bridges or spans instead of roads/driveways/trails with culverts.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A

lrn@des.nh.gov or (603) 271-2147

NHDES Wetlands Bureau, 29 Hazen Drive, PO Box 95, Concord, NH 03302-0095

www.des.nh.gov

A/M BMPs	The project is designed to minimize the number and size of crossings, and crossings cross wetlands and/or streams at the narrowest point.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
Env-Wt 500 Env-Wt 600 Env-Wt 900	Wetland and stream crossings include features that accommodate aquatic organism and wildlife passage.	<input checked="" type="checkbox"/> Check <input type="checkbox"/> N/A
Env-Wt 900	Stream crossings are sized to address hydraulic capacity and geomorphic compatibility.	<input checked="" type="checkbox"/> Check <input type="checkbox"/> N/A
A/M BMPs	Disturbed areas are used for crossings wherever practicable, including existing roadways, paths, or trails upgraded with new culverts or bridges.	<input checked="" type="checkbox"/> Check <input type="checkbox"/> N/A
SECTION 4 - NON-TIDAL SHORELINE STRUCTURES		
Env-Wt 313.03(c)(1)	The non-tidal shoreline structure has been designed to use the minimum construction surface area over surfaces waters necessary to meet the stated purpose of the structure.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
Env-Wt 313.03(c)(2)	The type of construction proposed for the non-tidal shoreline structure is the least intrusive upon the public trust that will ensure safe navigation and docking on the frontage.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
Env-Wt 313.03(c)(3)	The non-tidal shoreline structure has been designed to avoid and minimize impacts on the ability of abutting owners to use and enjoy their properties.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
Env-Wt 313.03(c)(4)	The non-tidal shoreline structure has been designed to avoid and minimize impacts to the public's right to navigation, passage, and use of the resource for commerce and recreation.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
Env-Wt 313.03(c)(5)	The non-tidal shoreline structure has been designed, located, and configured to avoid impacts to water quality, aquatic vegetation, and wildlife and finfish habitat.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
Env-Wt 313.03(c)(6)	The non-tidal shoreline structure has been designed to avoid and minimize the removal of vegetation, the number of access points through wetlands or over the bank, and activities that may have an adverse effect on shoreline stability.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A

BUREAU OF ENVIRONMENT CONFERENCE REPORT

SUBJECT: NHDOT Monthly Natural Resource Agency Coordination Meeting

DATE OF CONFERENCE: July 21, 2021

LOCATION OF CONFERENCE: Virtual meeting held via Zoom

ATTENDED BY:

NHDOT

Andrew O’Sullivan
Matt Urban
Mark Hemmerlein
Rebecca Martin
Arin Mills
Samantha Fifield
Maggie Baldwin
Cassandra Burns
Jason Abdulla
Meli Dube
Marc Laurin
Trent Zanes
Tonty King
Sarah Healey
Jennifer Reczek
Kerry Ryan
Tim Boodey

Joseph Jorgens
Jim MacMahon

EPA

Jeanie Brochi

NHDES

Lori Sommer
Karl Benedict
Cheryl Bondi

NHB

Jessica Bouchard

Federal Highway

Jaimie Sikora

The Nature Conservancy

Pete Steckler

LCHIP

Paula Bellemore

Consultants/ Public

Participants

Christine Perron
Susan Francher
Tracey Boisvert

PRESENTATIONS/ PROJECTS REVIEWED THIS MONTH: *(minutes on subsequent pages)*

Finalize Meeting Minutes.....	2
New London, 42877, X-A004(976)	2
Dummer-Cambridge-Errrol, #16304B (X-A004(699))	4
Eaton Culvert Replacement, #1832-H-1	8
Wakefield Culvert Replacement, # 2019-M312-1.....	10
Middleton, #43067.....	11
Bath, #43247, (X-A005(062))	14
Sandwich, #43487	17

Clarification is needed on Areas B and AN – Will there be permanent impacts at these locations? Jason Abdulla responded that those locations are still being assessed but there may be some unavoidable permanent bank impacts. Lori noted that the NHDES bank stabilization rules would need to be addressed for those locations and at the tributaries.

Lori asked if there was an opportunity to provide a dry culvert near the northern crossing for terrestrial wildlife passage. Christine responded that this could be reviewed.

Regarding mitigation, Lori noted that receiving credit for the created channels of the tributaries was reasonable but would entail a permit condition requiring post-construction reporting and monitoring. She commented that permanent bank impacts would require mitigation.

Carol Henderson (NHFG): Carol agreed with Lori's comment on looking into providing wildlife passage opportunities to improve connectivity. She also noted that she would like to see more vegetation in the buffer than what appears to be growing in the buffer of the recently constructed project.

Mike Hicks (ACOE): Mike confirmed that the project would require an Individual 404 Permit. He noted that an EFH Assessment would be needed for any impacts below OHW of the Androscoggin. Christine replied that she had previously coordinated with Mike Johnson on this and determined that the Androscoggin River in NH is no longer designated as Essential Fish Habitat. This determination provided to Mike in writing following the meeting.

Jean Brochi (EPA): Jean agreed with the comments made by others and offered no additional comments.

Pete Steckler (TNC): Pete echoed the request to look into improving connectivity and said he would also like to see the details of the created stream channels. Christine confirmed that those details could be reviewed at a future meeting.

Eaton Culvert Replacement, #1832-H-1

Arin Mills, NHDOT Senior Environmental Manager, and Samantha Fifield, District 3 Civil Engineer, presented the proposed culvert replacement project which carries NH 153 over an un-named tributary to Crystal Lake. This state funded project proposes to replace the existing granite block crossing with a precast concrete structure. Arin explained the stream drains the Rockhouse Mtn range and from the site it flows about 0.2 miles where it enters Crystal Lake. The crossing is a Tier 3 as delineated by StreamStats. Arin showed some photos to include both the upstream/downstream and inlet/outlet of the existing structure. Dense Japanese knotweed was noted at the site.

Sam gave a project overview, to include the replacement of the existing 8' wide by 4'-7" high granite block with concrete extensions with an 8' wide by 7' high precast concrete box with 2' of embedment. Sam explained the previous permit for rehabilitation was determined to not provide enough benefit for the cost and would also not improve safety, and a replacement was proposed. The new crossing will be extended from 30' to 36' to improve safety and improve roadway maintenance activities. The project will also replace the headwalls and wingwalls. The location has no history of flooding. Sam showed the

preliminary impact plans and further described permanent impact due to increase in length. Sam also mentioned the site has constraints on size due to private property/infrastructure adjacent to structure. Sam provided a basic construction sequence and showed a proposed erosion control plan. A chart depicting the results of the hydraulic analysis for both the existing and proposed structure. Sam said the current design will not pass the 100-year storm event, and therefore will need to be an alternative design. There is no history of flooding at this location and based on stream gauge data for the area, the proposed design will pass a significant storm event.

Arin provided a summary of the environmental review to include the un-named stream is a 3rd order to Crystal Lake, no Shoreland Water Quality Protection Act. The stream is a Tier 3 crossing with a drainage area of 1.34 square miles. No Designated River. A previous permit 2016-03053 for repair that was not constructed and the current proposed project is to replace. The stream is predicted coldwater per the Wildlife Action Plan, with no fish data in the stream. Crystal Lake is a 'Warm to cool acidic lake' and stocked with Brown trout. NHB21-0911 had no species recorded, no Priority Resource Areas identified. There is a dense stand of Japanese knotweed surrounding the project which will be addressed to prevent spread during construction.

Arin showed data from the Stream crossing initiative, which depicted the geomorphic compatibility as 'Mostly compatible' and Aquatic Organism Passage as 'Reduced Passage'. The stream assessment determined the stream a Rodgen type B in the reach with moderate entrenchment, width/depth ratio and slope. The bankfull width of 11.7' in reach and a compliant structure of 16.4'. The crossing is within a 100-year floodplain. The iPaC determined potential for Northern long-eared bat (NLEB) and small whorled pogonia. A 4(d) consistency determination was obtained for the NLEB. A field review for the pogonia determined no plants found and limited habitat potential due to dense stand of Knotweed, a no effect determination was reached.

Matt U reviewed the impacts for mitigation are associated with the extension, and no impacts for the proposed temporary pipe. Also, there is existing rip rap in the area and impacts calculated were for the crossing extension, and not for areas of existing rip rap. Lorie S stated mitigation would be likely due to permanent impacts to the Priority Resource Area (PRA) for the extension. Cheryl B asked to follow up with the data from the ARM Mapper to determine findings and reduced passage element based on the SADES ID. Lorie S concurred with the Alternative design and the PE certification would provide the details. She asked about the possibility of a wildlife shelf. Sam F said she could explore the possibility of a wildlife shelf, and would want to ensure it does not further reduce the hydraulic capacity of the crossing. Cheryl mentioned if the reduced passage identified in the SADES data could be improved with the design and Lorie said to ensure the clean water bypass will pass the 2-year storm event. She also asked about Japanese knotweed control. Sam F said the stems would be cut and kept onsite to reduce spread, and possibly explore the use of steel mesh. No herbicide would be used due to proximity to stream and nearby drinking water well.

Carol H said she would defer to DES for time of year restrictions, and encourages the incorporation of a wildlife shelf. Gene B had not comment. Pete S asked if an 8' box or other wider options were considered and Sam F said the 8' wide box was proposed due to limitations on construction equipment and personnel for this state funded and constructed project. She further explained a wider box would exceed the budget.

No Mitigation Required

The proposed work and mitigation analysis associated with Eaton #43475 were discussed at the July 21, 2021 Natural Resource agency meeting. The minutes reflect the details of the conversation indicating mitigation could be required if there was impact to a Priority Resource Area (PRA). There is no PRA associated with the project. There is a 100 year flood plain, however no flood plain wetland contiguous to a Tier 3 stream crossing. Mitigation for the project is not required.

Mills, Arin

From: Mills, Arin
Sent: Friday, September 24, 2021 7:17 AM
To: Bondi, Cheryl
Subject: RE: DOT Eaton Culvert Replacement Follow-Up
Attachments: Looking_Upstream.JPG

Thanks for looking Cheryl. Having been onsite there is substrate throughout the crossing. I guessing that parameter was not collected properly. The proposed structure will be embedded with stream simulation.

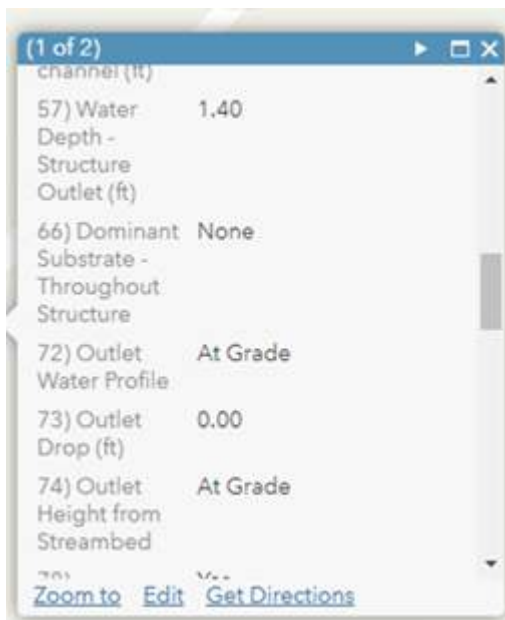
~ Arin

From: Bondi, Cheryl <Cheryl.A.Bondi@des.nh.gov>
Sent: Thursday, September 23, 2021 2:31 PM
To: Mills, Arin <Arin.J.Mills@dot.nh.gov>
Subject: RE: DOT Eaton Culvert Replacement Follow-Up

Hi Arin,

If I recall, the discussion was around why the box culvert was ranked as “Reduced Passage” when it looks like it is embedded, at grade, and has continuous substrate throughout. Looking at the data more closely I can see that the reason this was ranked as “reduced” is because parameter #66 “is there substrate throughout” = none. This automatically defaults the AOP score to “Reduced”. Unfortunately, the photos on SADES for this crossing are not good, so it is hard to see whether this parameter was collected correctly or not.

Best,
Cheryl







Cheryl Bondi, Ph.D; *Program Specialist, Aquatic Resource Mitigation Program*
Wetlands Bureau, Land Resources Management
Water Division, NH Department of Environmental Services
P.O. Box 95
Concord, NH 03302-0095
Phone: (603) 271-0727
Email: Cheryl.Bondi@des.nh.gov
[Visit the ARM Fund website!](#)



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From: Mills, Arin <Arin.J.Mills@dot.nh.gov>
Sent: Thursday, September 23, 2021 12:13 PM
To: Bondi, Cheryl <Cheryl.A.Bondi@des.nh.gov>
Subject: DOT Eaton Culvert Replacement Follow-Up

Cheryl,

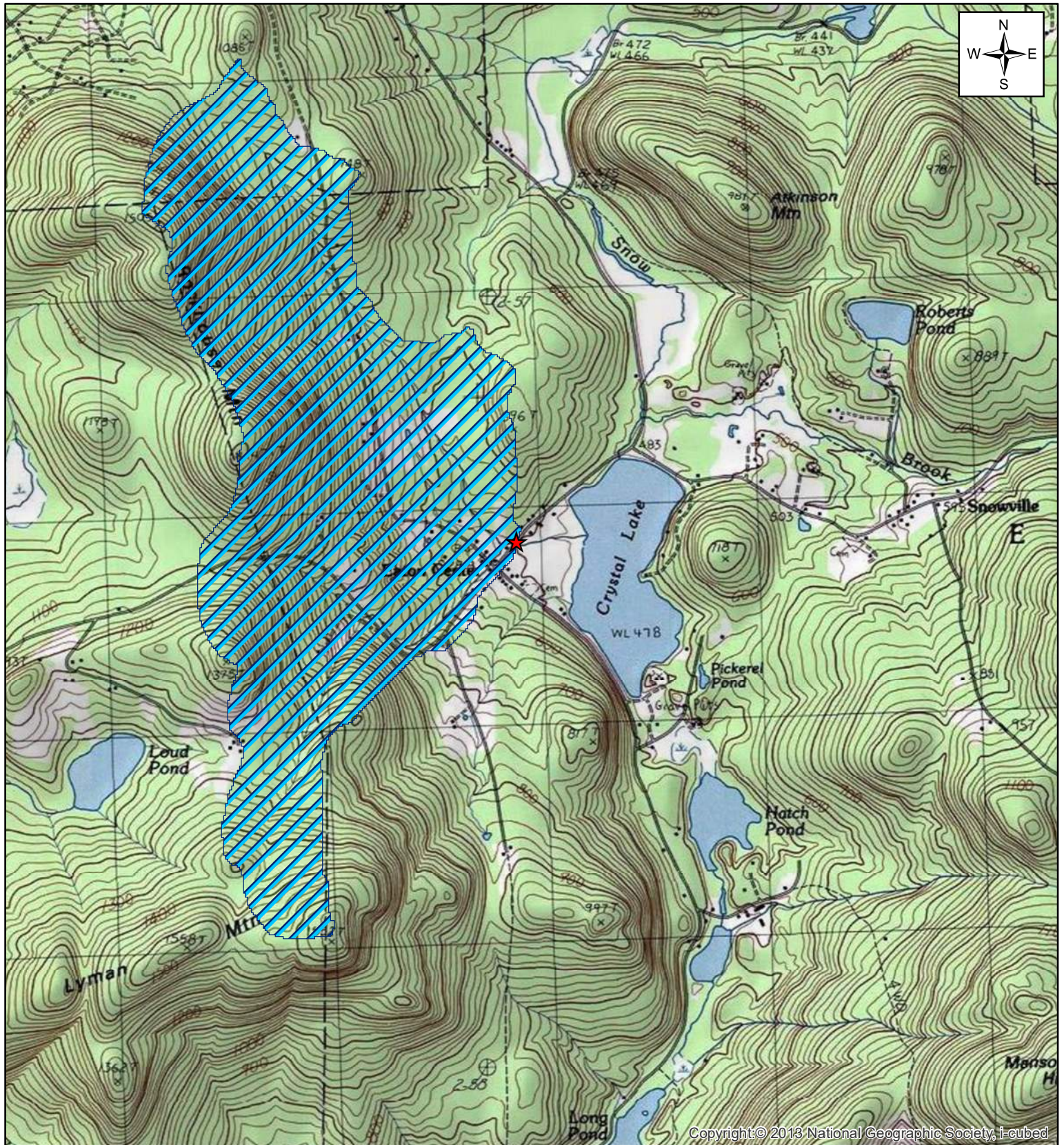
I just wanted to follow-up quickly on a comment that came up during the July 21, 2021 Natural Resource Agency Meeting for project # 1832-H-1. The SADES ID for this crossing is 265 with an assessment date of 2014 (see screenshot). THE AOP score is determined to have 'Reduced Passage'. You mentioned you may be able to provide a bit of additional detail to this finding. If you can take a look and send any information my way I would appreciate it.

I also attached the minutes from the meeting to help with your understanding of the project.

Thanks!

Arin Mills
Senior Environmental Manager, Operations Management
NH Department of Transportation
Bureau of Environment
7 Hazen Drive, Concord, NH 03302
Ph: (603)271-0187
Arin.j.mills@dot.nh.gov

Eaton, Project #1832-H-1



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0 0.25 0.5 0.75
Miles

1:24,000

New Hampshire
DOT
Department of Transportation



Legend

- ★ Project Location
- ▨ Watershed

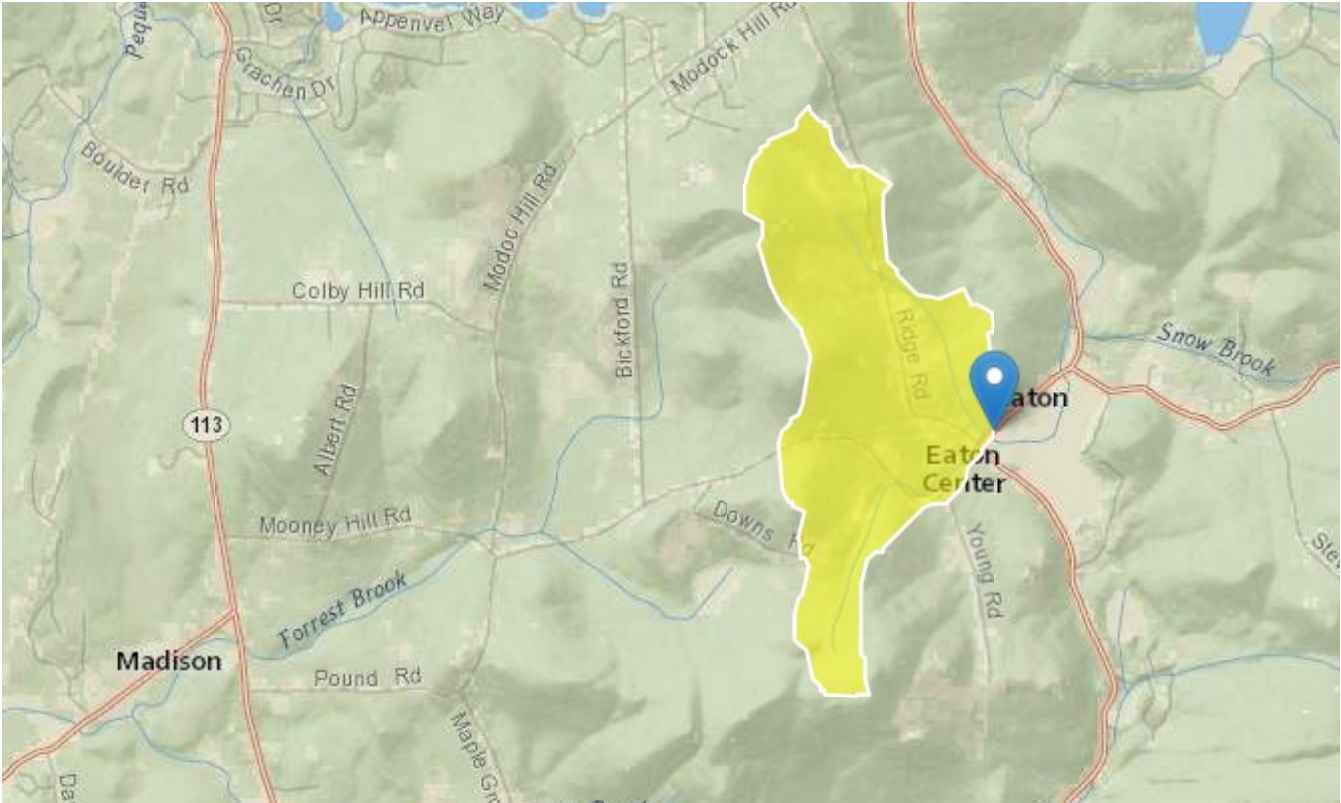
Map depicting culvert replacement project #1832H-1 which carries NH 153 over an un-named tributary to Crystal Lake.

Map created by: Arin Mills on 6/29/2021

Source: S:\Environment\PROJECTS\Eaton\1832-H-1

StreamStats Report for the NH Route 153 over the Inlet to Crystal Lake Culvert

Region ID: NH
Workspace ID: NH20201211202234262000
Clicked Point (Latitude, Longitude): 43.91065, -71.08073
Time: 2020-12-11 15:22:51 -0500



Basin Characteristics			
Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	1.34	square miles
APRAVPRE	Mean April Precipitation	4.172	inches
WETLAND	Percentage of Wetlands	0.1305	percent

Parameter Code	Parameter Description	Value	Unit
CSL10_85	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known	293	feet per mi
TEMP	Mean Annual Temperature	42.622	degrees F
PREG_06_10	Mean precipitation at gaging station location for June to October summer period	19.4	inches
CONIF	Percentage of land surface covered by coniferous forest	12.0456	percent
PREBC0103	Mean annual precipitation of basin centroid for January 1 to March 15 winter period	8.78	inches
BSLDEM30M	Mean basin slope computed from 30 m DEM	20.84	percent
MIXFOR	Percentage of land area covered by mixed deciduous and coniferous forest	51.1843	percent
PREG_03_05	Mean precipitation at gaging station location for March 16 to May 31 spring period	10	inches
TEMP_06_10	Basinwide average temperature for June to October summer period	59.166	degrees F
ELEVMAX	Maximum basin elevation	1548.748	feet
PRECIPOUT	Mean annual precip at the stream outlet (based on annual PRISM precip data in inches from 1971-2000)	47.5	inches
MINTEMP_W	Mean winter minimum air temperature over basin surface area	9.566	degrees F
SNOFALL	Mean Annual Snowfall	93.584	inches
PREBC_1112	Mean annual precipitation of basin centroid for November 1 to December 31 period	9.25	inches
PRECIPCENT	Mean Annual Precip at Basin Centroid	47.3	inches

Peak-Flow Statistics Parameters^[Peak Flow Statewide SIR2008 5206]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.34	square miles	0.7	1290

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
APRAVPRE	Mean April Precipitation	4.172	inches	2.79	6.23
WETLAND	Percent Wetlands	0.1305	percent	0	21.8
CSL10_85	Stream Slope 10 and 85 Method	293	feet per mi	5.43	543

Peak-Flow Statistics Flow Report^[Peak Flow Statewide SIR2008 5206]

PII: Prediction Interval-Lower, Plu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PII	Plu	SEp	Equiv. Yrs.
2 Year Peak Flood	93.3	ft ³ /s	57	153	30.1	3.2
5 Year Peak Flood	165	ft ³ /s	99.4	274	31.1	4.7
10 Year Peak Flood	228	ft ³ /s	135	386	32.3	6.2
25 Year Peak Flood	314	ft ³ /s	179	550	34.3	8
50 Year Peak Flood	387	ft ³ /s	214	699	36.4	9
100 Year Peak Flood	475	ft ³ /s	254	888	38.6	9.8
500 Year Peak Flood	691	ft ³ /s	340	1400	44.1	11

Peak-Flow Statistics Citations

Olson, S.A.,2009, Estimation of flood discharges at selected recurrence intervals for streams in New Hampshire: U.S.Geological Survey Scientific Investigations Report 2008-5206, 57 p. (<http://pubs.usgs.gov/sir/2008/5206/>)

Low-Flow Statistics Parameters^[Low Flow Statewide]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.34	square miles	3.26	689
TEMP	Mean Annual Temperature	42.622	degrees F	36	48.7
PREG_06_10	Jun to Oct Gage Precipitation	19.4	inches	16.5	23.1

Low-Flow Statistics Disclaimers^[Low Flow Statewide]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Low-Flow Statistics Flow Report^[Low Flow Statewide]

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.0904	ft ³ /s
7 Day 10 Year Low Flow	0.0302	ft ³ /s

Low-Flow Statistics Citations

Flynn, R.H. and Tasker, G.D.,2002, Development of Regression Equations to Estimate Flow Durations and Low-Flow-Frequency Statistics in New Hampshire Streams: U.S.Geological Survey Scientific Investigations Report 02-4298, 66 p. (<http://pubs.water.usgs.gov/wrir02-4298>)

Flow-Duration Statistics Parameters^[Low Flow Statewide]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.34	square miles	3.26	689
PREG_06_10	Jun to Oct Gage Precipitation	19.4	inches	16.5	23.1
TEMP	Mean Annual Temperature	42.622	degrees F	36	48.7

Flow-Duration Statistics Disclaimers^[Low Flow Statewide]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Flow-Duration Statistics Flow Report^[Low Flow Statewide]

Statistic	Value	Unit
60 Percent Duration	0.772	ft ³ /s
70 Percent Duration	0.53	ft ³ /s
80 Percent Duration	0.308	ft ³ /s
90 Percent Duration	0.156	ft ³ /s
95 Percent Duration	0.0946	ft ³ /s
98 Percent Duration	0.0581	ft ³ /s

Flow-Duration Statistics Citations

Flynn, R.H. and Tasker, G.D.,2002, Development of Regression Equations to Estimate Flow

Durations and Low-Flow-Frequency Statistics in New Hampshire Streams: U.S. Geological Survey Scientific Investigations Report 02-4298, 66 p. (<http://pubs.water.usgs.gov/wrir02-4298>)

Seasonal Flow Statistics Parameters^[Low Flow Statewide]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.34	square miles	3.26	689
CONIF	Percent Coniferous Forest	12.0456	percent	3.07	56.2
PREBC0103	Jan to Mar Basin Centroid Precip	8.78	inches	5.79	15.1
BSLDEM30M	Mean Basin Slope from 30m DEM	20.84	percent	3.19	38.1
MIXFOR	Percent Mixed Forest	51.1843	percent	6.21	46.1
PREG_03_05	Mar to May Gage Precipitation	10	inches	6.83	11.5
TEMP	Mean Annual Temperature	42.622	degrees F	36	48.7
TEMP_06_10	Jun to Oct Mean Basinwide Temp	59.166	degrees F	52.9	64.4
PREG_06_10	Jun to Oct Gage Precipitation	19.4	inches	16.5	23.1
ELEVMAX	Maximum Basin Elevation	1548.748	feet	260	6290

Seasonal Flow Statistics Disclaimers^[Low Flow Statewide]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Seasonal Flow Statistics Flow Report^[Low Flow Statewide]

Statistic	Value	Unit
Jan to Mar15 60 Percent Flow	1.1	ft ³ /s
Jan to Mar15 70 Percent Flow	0.923	ft ³ /s
Jan to Mar15 80 Percent Flow	0.779	ft ³ /s
Jan to Mar15 90 Percent Flow	0.562	ft ³ /s
Jan to Mar15 95 Percent Flow	0.439	ft ³ /s

Statistic	Value	Unit
Jan to Mar15 98 Percent Flow	0.346	ft ³ /s
Jan to Mar15 7 Day 2 Year Low Flow	0.739	ft ³ /s
Jan to Mar15 7 Day 10 Year Low Flow	0.396	ft ³ /s
Mar16 to May 60 Percent Flow	3.49	ft ³ /s
Mar16 to May 70 Percent Flow	2.68	ft ³ /s
Mar16 to May 80 Percent Flow	1.87	ft ³ /s
Mar16 to May 90 Percent Flow	1.24	ft ³ /s
Mar16 to May 95 Percent Flow	0.864	ft ³ /s
Mar16 to May 98 Percent Flow	0.588	ft ³ /s
Mar16 to May 7 Day 2 Year Low Flow	0.999	ft ³ /s
Mar16 to May 7 Day 10 Year Low Flow	0.543	ft ³ /s
Jun to Oct 60 Percent Flow	0.269	ft ³ /s
Jun to Oct 70 Percent Flow	0.196	ft ³ /s
Jun to Oct 80 Percent Flow	0.131	ft ³ /s
Jun to Oct 90 Percent Flow	0.0816	ft ³ /s
Jun to Oct 95 Percent Flow	0.055	ft ³ /s
Jun to Oct 98 Percent Flow	0.0453	ft ³ /s
Jun to Oct 7 Day 2 Year Low Flow	0.0921	ft ³ /s
Jun to Oct 7 Day 10 Year Low Flow	0.0312	ft ³ /s
Nov to Dec 60 Percent Flow	1.37	ft ³ /s
Nov to Dec 70 Percent Flow	1.07	ft ³ /s
Nov to Dec 80 Percent Flow	0.829	ft ³ /s
Nov to Dec 90 Percent Flow	0.548	ft ³ /s
Nov to Dec 95 Percent Flow	0.359	ft ³ /s
Nov to Dec 98 Percent Flow	0.222	ft ³ /s
Oct to Nov 7 Day 2 Year Low Flow	0.781	ft ³ /s
Oct to Nov 7 Day 10 Year Low Flow	0.336	ft ³ /s

Seasonal Flow Statistics Citations

Flynn, R.H. and Tasker, G.D.,2002, Development of Regression Equations to Estimate Flow

Durations and Low-Flow-Frequency Statistics in New Hampshire Streams: U.S. Geological Survey Scientific Investigations Report 02-4298, 66 p. (<http://pubs.water.usgs.gov/wrir02-4298>)

Recharge Statistics Parameters[Groundwater Recharge Statewide 2004 5019]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
PRECIPOUT	Mean Annual Precip at Gage	47.5	inches	35.83	53.11
TEMP	Mean Annual Temperature	42.622	degrees F	36.05	48.69
MINTEMP_W	Mean Winter Min Temperature	9.566	degrees F	0.8	19.88
CONIF	Percent Coniferous Forest	12.0456	percent	3.07	56.18
PREG_03_05	Mar to May Gage Precipitation	10	inches	6.83	11.54
SNOFALL	Mean Annual Snowfall	93.584	inches	54.46	219.07
PREG_06_10	Jun to Oct Gage Precipitation	19.4	inches	16.46	23.11
MIXFOR	Percent Mixed Forest	51.1843	percent	6.21	46.13
PREBC_1112	Nov to Dec Basin Centroid Precip	9.25	inches	6.57	15.2
PRECIPCENT	Mean Annual Precip at Basin Centroid	47.3	inches	37.44	75.91

Recharge Statistics Disclaimers[Groundwater Recharge Statewide 2004 5019]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Recharge Statistics Flow Report[Groundwater Recharge Statewide 2004 5019]

Statistic	Value	Unit
GW_Recharge_Jan_to_Mar15	5.23	in
GW_Recharge_Mar16_to_May	9.49	in
GW_Recharge_Jun_to_Oct	3.34	in
GW_Recharge_Nov_to_Dec	4.41	in
GW_Recharge_Ann	23.8	in

Recharge Statistics Citations

Flynn, R.H. and Tasker, G.D., 2004, Generalized Estimates from Streamflow Data of Annual and Seasonal Ground-Water-Recharge Rates for Drainage Basins in New Hampshire, U.S. Geological Survey Scientific Investigations Report 2004-5019, 67 p. (<http://pubs.usgs.gov/sir/2004/5019/http://pubs.usgs.gov/sir/2004/5019/>)

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Application Version: 4.4.0

Alternative Design Report for the replacement of the NH Route 153 Culvert that conveys a no name brook to Crystal Lake in Eaton New Hampshire 1832-H-1 (2020-M303-2)

Report submitted by: Samantha D. Fifield, PE
Civil Engineer for NHDOT Bureau of Highway Maintenance-District 3



Introduction:

The NHDOT Bureau of Highway Maintenance District 3 proposes to replace an existing deteriorated Tier 3 crossing (1.34 square miles) with a pre-cast concrete box structure. This project will not be advertised out for Bid, so a Contractor will not be completing the work. Removal of the existing culvert and installation of the new culvert will be completed in whole by District 3 highway maintenance forces. This project will be fully funded by the State of NH, and constrained, in particular, by District 3's budget. And all work impacts must remain within the State's Right-of-Way.

The existing granite block culvert (with cast in place concrete extensions) is located in Eaton on NH Route 153, approximately 425 feet northeast of the intersection of NH 153/ Ridge Rd/Glines Hill Rd, and conveys a no name brook to Crystal Lake. The inlet side of the culvert is located between a private parking area and a hillside. The outlet side of the culvert abuts fields. The existing culvert is approximately 29.5' long and has an opening that is approximately 8' wide by 4'-7" tall. The exact age of the granite block culvert cannot be determined; however, granite block culverts were typically built in NH prior to 1930. The age of the cast in place concrete extensions is also unknown as documentation for this work has not been located; however, it is known to be at least 40 years old. It is estimated that the structure is approximately between 90 to 100 years old.

The existing crossing meets all of the relevant General Design Considerations noted in Env-WT 901.01 (a) and has no history of flooding over the roadway. It is worth noting that the stream banks and channel adjacent to the culvert are well armored with stone, so the existing structure is protected should stormwater flow over the roadway.

Alternatives Investigated:

District 3 investigated multiple solutions for this crossing and are discussed below:

Alternative 1 – Rehabilitate the top of the existing culvert:

The roadway over the existing culvert has developed indicators that the top of the culvert is deteriorating (small sinkholes, cracks, pavement deformation). So, District 3 had previously secured a wetland permit (2016-03053) allowing NHDOT Bridge Maintenance forces to replace the top of the existing structure with a cast in place concrete slab.

Unfortunately, the whole culvert has deteriorated to such a degree that rehabilitating the culvert's top will not prevent fines from escaping through the culvert's granite block walls, which is compromising the stability of the roadway. Moreover, this alternative does not address winter maintenance issues associated with the proximity of the existing culvert headwalls to the travel way.

The existing culvert has no history of flooding over the roadway. However, it cannot fully pass the 50-year design storm nor the 100-year design storm (Env-Wt 904.07 (c)(2)).

Alternative 2 - Replace with a bridge that spans 16.0' and is 36' wide:

Following UNH's May 2009 Stream Crossing Guidelines, a bridge that spans 16' is a fully compliant structure. Unfortunately, this option cannot be built by District 3 forces.

This option would require a significant increase in preliminary engineering costs. And the fully designed bridge Plans would have to be advertised to an outside Contractor to build. Typically, for small bridge projects, preliminary engineering costs are between 12% and 25% of the cost to construct the bridge, depending on site conditions and complexity of the project. And typically, the cost to build a new bridge of this size could be anywhere between \$500,000 to \$750,000 when you factor in the cost to build the superstructure and substructure (or large precast concrete structure), cofferdams, water diversion structures, erosion control measures, and traffic control. This option would also require impacts outside of the state's right-of-way and may require guardrail, which would impact the aesthetics of the area.

Moreover, NHDOT Bridge Design guidelines also require 1-foot of freeboard between the elevation of the 100-year design storm and the bottom of the superstructure, which may require an adjustment in the roadway's profile. This would increase the overall cost of the project by approximately \$300,000.

This alternative is both cost prohibitive and exceeds District 3's construction capabilities.

Alternative 3 - Replace with 36' long x 11' wide x 7' tall structure sunk 2':

This alternative maintains or improves upon the existing culvert's characteristics and also passes the theoretical 100-year design storm. However, the size and weight of the precast segments exceeds District 3's construction capabilities. This option would also increase costs by approximately \$30,000 over the preferred option, which exceeds District 3's budgetary ability.

Alternative 4 (Preferred Alternative) - Replace with 36' long x 8' wide x 7' tall structure sunk 2':

This alternative maintains or improves upon the existing crossing's characteristics but cannot pass the theoretical 100-year design storm (Env-Wt 904.07(c)(2)). However, the existing site is armored, and the culvert has been designed with cutoff walls. So, if a storm were to overtop the roadway, it is doubtful that it would significantly damage the structure. An 8' wide by 7' tall precast box culvert the largest and the heaviest structure that can be built by District 3 forces, and is District 3's most cost effective solution.

Alternative	Dimensions	Cost of Additional PE	Estimated Construction Costs	Hydraulic Capacity	Comment
1 – Rehabilitate the top of the Existing Structure	29.5' wide x 8' span x 4'-7" tall	N/A	\$25,000, for the top	25-year design storm	No history of flooding over the roadway
2 - Bridge	16' span x 36' wide x height determined by required freeboard	15-25% the cost to construct	\$500,000-\$750,000	100-year design storm with 1' freeboard	Roadway profile changes may be required at an additional cost of \$300,000. This alternative requires the development of contract Plans and documents, ROW impacts to abutting

Alternative	Dimensions	Cost of Additional PE	Estimated Construction Costs	Hydraulic Capacity	Comment
					properties, as well as the procurement of a Contractor to build it.
3 - Precast Box	11' span x 36' wide x 7' tall, sunk 2'	N/A	\$100,000 (est. for precast box)	100 year design storm	The weight of 4' precast box segments exceeds the upper limit of D3's abilities to construct.
4 - Precast Box (Preferred Alternative)	8' span x 36' wide x 7' tall, sunk 2'	N/A	\$70,000 (est. for precast box)	50 year design storm	The weight of 4' precast box segments near the upper limit of D3's abilities to construct.

Hydraulic Capacity Analysis

A thorough hydraulic analysis was completed on the existing culvert and on the alternative selected, see Summary of HydroCAD Analysis. While the Preferred Alternative does not meet the capacity requirements outlined in Env-Wt 904.07 (c)(2), it does improve the crossing's capacity over the existing culvert. Moreover, both the existing culvert and the proposed replacement culvert do pass the highest recorded storm in the area.

Project qualification:

Replacement of the existing culvert with an 8' wide x 7' tall box culvert, which is sunk 2', does qualify under Env-Wt 904.04 as:

- Env-Wt 904.09 (a) – This crossing's Tier 3 classification is based only on the size of its contributing watershed.
- Env-Wt 904.09 (c) (1) – This crossing does not have any history of causing or contributing to flooding that damages the crossing or other human infrastructure or protected species or habitat.
- Env-Wt 904.09 (c) (2) – The proposed precast box culvert does:
 - a. Meet the criteria specified in Env-Wt 904.01
 - b. Enhances the hydraulic capacity of the stream crossing (The existing crossing passes the 25-year design storm; the proposed crossing passes the 50-year design storm.)
 - c. Maintains the crossing's capacity to accommodate aquatic organism passage (The cross section of the proposed box culvert mimics the existing culvert, and will maintain aquatic organism passage in kind with the existing culvert.)
 - d. Maintains connectivity between the crossing's upstream and downstream reaches (The profile of the proposed culvert matches into the existing stream's profile, which allows for connectivity between the upstream and downstream reaches.)
 - e. Will not cause, or contribute to, an increase in the frequency of flooding or overtopping of the banks located upstream or downstream of the crossing (The proposed crossing will not cause increases in flooding because the new structure is slightly larger than the old structure. And the downstream reach has the capacity to accommodate additional flow from the proposed culvert.)

Summary of HydroCAD Analysis

A HydroCAD model was created to evaluate both the existing and the proposed precast box culverts' performance using the following information and data:

- Catchment areas were originally delineated by Streamstats (shapefile). These areas were then revised using USGS maps and engineering judgement. Time of concentration was calculated based on the information provided on the USGS map and the latest aerials for surface cover.
- A soil map was developed using the USDA soils survey website. The catchment area shape file downloaded from the StreamStats website was used to delineate the soils map area, see attached soils report. While the actual catchment area used in the analysis was revised using engineering judgement, the CN value calculated using the original Streamstats shape file delineated area remained unchanged as revising the area would not have created a significant change in the overall CN of the project. Moreover, saturated conditions were selected when calculating the CN (D values were used for A/D, B/D, and C/D soils), creating a conservative estimate of runoff.
- 24-hour Extreme Precipitation Estimates from the Northeast Regional Climate Center were inputted into the HydroCAD model to evaluate this crossing for multiple storms, see attached precipitation tables.
- Stream gauge metadata, from the NRCC site, was also used in the model as there is no history of flooding at this culvert location and the NRCC's extreme precipitation estimates produced overly large flow results that have no historical relevance.
- A topographic survey was completed at this location, so culvert elevations reflect surveyed data. USGS elevation data supplemented the remaining input data within the HydroCADD model. The elevation of the top of roadway is at 502.55'.

Results of the analysis are reported in the tables below:

Storm Year	Existing Culvert HydroCAD Analysis Results				
	24-Hr Precipitation (in)	Storm Peak Flow (cfs)	Peak Flow (cfs) through Culvert	Peak Elevation (ft)	Freeboard to Overtop Road (ft)
2	2.95	51.33	51.33	497.27	5.28
10	4.27	159.86	159.86	499.22	3.33
25	5.29	270.78	270.78	500.90	1.65
Storm Capacity – without overtopping road	6.12	373.16	373.16	502.55	0.0
50	6.22	386.08	379.19	502.69	0.14 above road
100	7.31	533.42	411.74	503.50	0.95 above road
Metada	5.01	238.48	238.48	500.44	2.11

As can be seen in the above table, the existing culvert does not have the capacity to pass the theoretical flow from the estimated 50-year and 100-year storm events, using NRCC's extreme precipitation storm data estimates. However, this crossing has no history of flooding. It has always passed storm water from a variety of storms without overtopping the roadway. So, the model was also run using actual gauge data from the nearest gauge station. Results for the model using actual gauge data shows that the existing culvert has the capacity to pass that storm.

Storm Year	Proposed Culvert HydroCAD Analysis Results				
	24-Hr Precipitation (in)	Storm Peak Flow (cfs)	Peak Flow (cfs) through Culvert	Peak Elevation (ft)	Freeboard to Overtop Road (ft)
2	2.95	51.33	51.33	497.23	5.32
10	4.27	159.86	159.86	499.17	3.38
25	5.29	270.78	270.78	500.74	1.81
50	6.22	386.08	386.08	502.16	0.39
Culvert's Storm Capacity	6.45	416.20	416.20	502.55	0.0
100	7.31	533.42	470.99	503.15	0.6 above road
From gauge metadata	5.01	238.48	238.48	500.31	2.24

It is worth noting that the new culvert's flow invert (which is 2.0' above the proposed structure's invert) is at an elevation 0.5-foot above the existing culvert's invert elevation as the new culvert's proposed profile elevation allows the new (longer) culvert to closely match the existing stream's profile.

As can be seen above, the results of the analysis demonstrated that the proposed culvert has the capacity to allow for the estimated 50-year storm flow without overtopping the roadway, increasing the crossing's capacity. Neither culvert seems able to pass an estimated 100-year storm (7.31 inches in 24-hours). However, the proposed culvert has greater capacity over the existing culvert; the proposed culvert can pass a 6.45" storm versus the existing culvert, which can pass a 6.12" storm. Both the existing and proposed culverts can pass a storm based on actual gauge data (5.01 inches in 24-hour period), which is backed by anecdotal information, as there is no history of overtopping flooding of the roadway at this location.



WETLANDS PERMIT APPLICATION STREAM CROSSING WORKSHEET

Water Division/Land Resources Management
Wetlands Bureau



RSA/Rule RSA 482-A/ Env-Wt-900

This worksheet can be used to accompany Wetlands Permit Applications when proposing stream crossings.

SECTION 1 - TIER CLASSIFICATIONS

Determine the contributing watershed size at [USGS StreamStats](#).

Note: Plans for tier 2 and 3 crossings shall be designed and stamped by a professional engineer who is licensed under RSA 310-A to practice in New Hampshire.

Size of contributing watershed at the crossing location: 857.6 acres

- ☐ **Tier 1:** A tier 1 stream crossing is a crossing located on a watercourse where the contributing watershed size is less than or equal to 200 acres.
- ☐ **Tier 2:** A tier 2 stream crossing is a crossing located on a watercourse where the contributing watershed size is greater than 200 acres and less than 640 acres.
- ☒ **Tier 3:** A tier 3 stream crossing is a crossing that meets **any** of the following criteria:
- ☒ On a watercourse where the contributing watershed is more than 640 acres.
 - ☐ Within a [designated river corridor](#) unless:
 - a. The crossing would be a tier 1 stream based on contributing watershed size, or
 - b. The structure does not create a direct surface water connection to the designated river as depicted on the national hydrography dataset as found on GRANIT.
 - ☒ Within a [100-year floodplain](#) (see Section 2 below).
 - ☐ In a jurisdictional area having any protected species or habitat ([NHB DataCheck](#)).
 - ☐ In a prime wetland or within a duly-established 100-foot buffer, unless a waiver has been granted pursuant to RSA 482-A:11, IV(b) and Env-Wt 706. Review the [Wetlands Permit Planning Tool \(WPPT\)](#) for town prime wetland and prime wetland buffer maps to determine if your project is within these areas.
- ☐ **Tier 4:** A tier 4 stream crossing is a crossing located on a tidal watercourse.

SECTION 2 - 100-YEAR FLOODPLAIN

Use the [FEMA Map Service Center](#) to determine if the crossing is located within a 100-year floodplain. Please answer the questions below:

- ☐ **No:** The proposed stream crossing *is not* within the FEMA 100-year floodplain.
- ☒ **Yes:** The proposed project *is* within the FEMA 100-year floodplain. Zone = **A**
Elevation of the 100-year floodplain at the inlet: 503.50 feet (FEMA El. or Modeled El.)

SECTION 3 - CALCULATING PEAK DISCHARGE

Existing 100-year peak discharge (Q) calculated in cubic feet per second (CFS): 533.42 CFS	Calculation method: HydroCAD
Estimated bankfull discharge at the crossing location: 411.74 CFS	Calculation method: HydroCAD

lrn@des.nh.gov or (603) 271-2147

NHDES Wetlands Bureau, 29 Hazen Drive, PO Box 95, Concord, NH 03302-0095

www.des.nh.gov

➡ **Note: If tier 1, then skip to Section 10** ⬅

SECTION 4 - PREDICTED CHANNEL GEOMETRY BASED ON REGIONAL HYDRAULIC CURVES

For **tier 2, tier 3 and tier 4** crossings only.

Bankfull Width: 14.4 feet Mean Bankfull Depth: 1.4 feet

Bankfull Cross Sectional Area: 20 square feet (SF)

SECTION 5 - CROSS SECTIONAL CHANNEL GEOMETRY: MEASUREMENTS OF THE EXISTING STREAM WITHIN A REFERENCE REACH

For **tier 2, tier 3 and tier 4** crossings only.

Describe the reference reach location: Upstream, Forested

Reference reach watershed size: 857.6 acres

Parameter	Cross Section 1 Describe bed form riffle (e.g. pool, riffle, glide)	Cross Section 2 Describe bed form riffle (e.g. pool, riffle, glide)	Cross Section 3 Describe bed form step (e.g. pool, riffle, glide)	Range
Bankfull Width	13 feet	10 feet	12 feet	10-13 feet
Bankfull Cross Sectional Area	17.6 SF	7 SF	9.9 SF	7-17.6 SF
Mean Bankfull Depth	1.4 feet	.7 feet	.8 feet	.7-1.4 feet
Width to Depth Ratio	9.6	14.3	14.5	9.6-14.5
Max Bankfull Depth	1.9 feet	1.1 feet	1.4 feet	1.1-1.9 feet
Flood Prone Width	22 feet	13.4 feet	23 feet	13.4-23 feet
Entrenchment Ratio	1.7	1.3	1.9	1.3-1.9

Use **Figure 1** below to determine the measurements of the Reference Reach Attributes

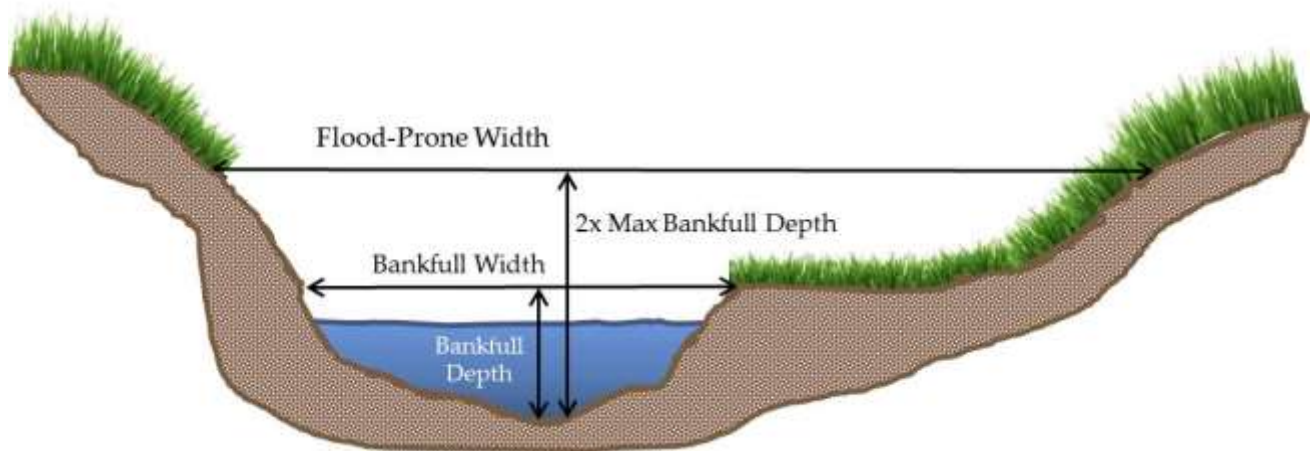


Figure 1: Determining the Reference Reach Attributes.

SECTION 6 - LONGITUDINAL PARAMETERS OF THE REFERENCE REACH AND CROSSING LOCATION

For **tier 2, tier 3 and tier 4** crossings only.

Average Channel Slope of the Reference Reach: 4

Average Channel Slope at the Crossing Location: 1

SECTION 7 - PLAN VIEW GEOMETRY

Note: Sinuosity is measured a distance of at least 20 times bankfull width, or 2 meander belt widths.

For **tier 2, tier 3 and tier 4** crossings only.

Sinuosity of the Reference Reach: 1

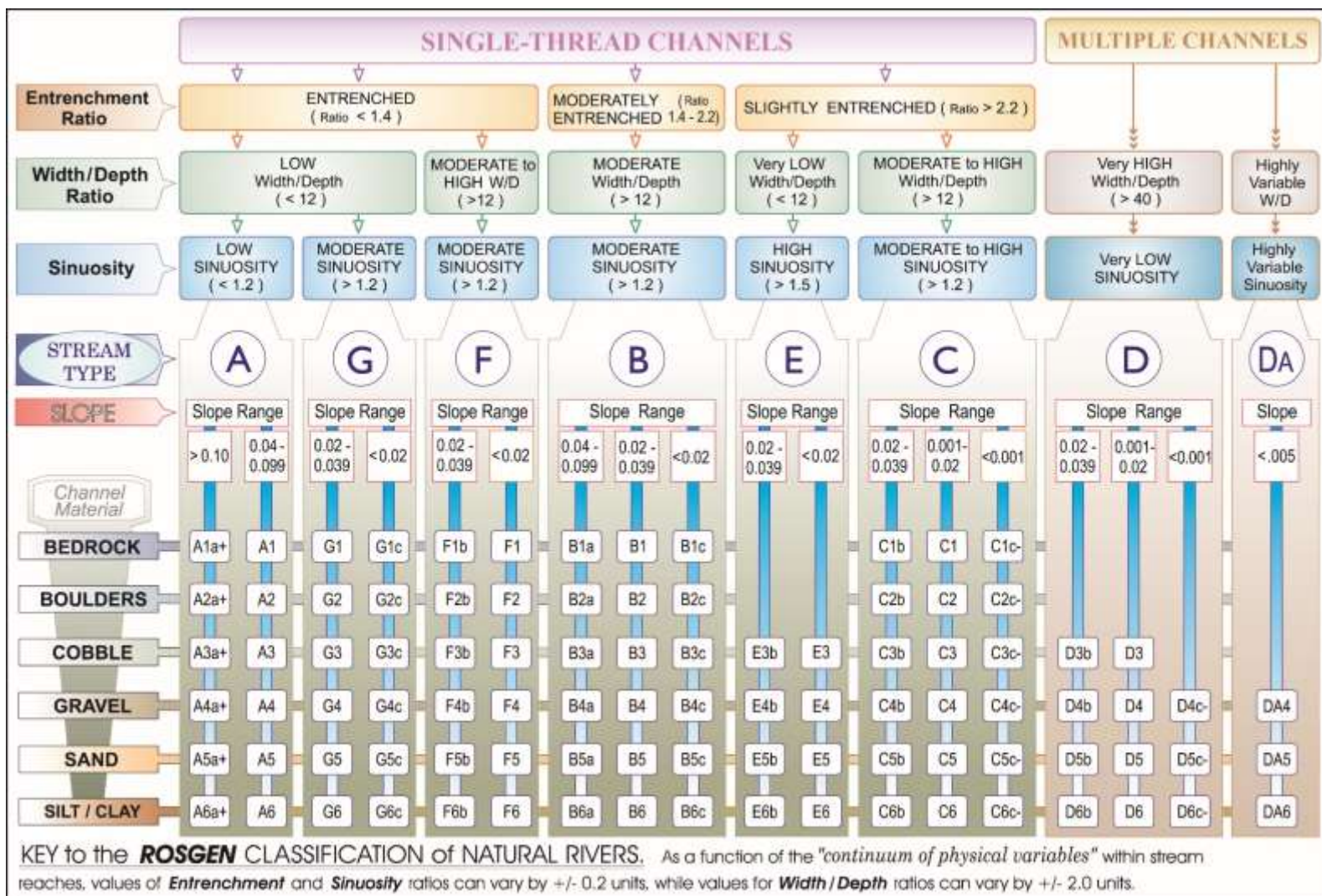
Sinuosity of the Crossing Location: 2.1

SECTION 8 - SUBSTRATE CLASSIFICATION BASED ON FIELD OBSERVATIONS*For tier 2, tier 3 and tier 4 crossings only.*

% of reach that is bedrock:	0 %
% of reach that is boulder:	20 %
% of reach that is cobble:	15 %
% of reach that is gravel:	25 %
% of reach that is sand:	40 %
% of reach that is silt:	0 %

SECTION 9 - STREAM TYPE OF REFERENCE REACH*For tier 2, tier 3 and tier 4 crossings only.*

Stream Type of Reference Reach: B

Refer to Rosgen Classification Chart (**Figure 2**) below:lrn@des.nh.gov or (603) 271-2147

NHDES Wetlands Bureau, 29 Hazen Drive, PO Box 95, Concord, NH 03302-0095

www.des.nh.gov

Figure 2: Reference from Applied River Morphology, Rosgen, 1996.

SECTION 10 - CROSSING STRUCTURE METRICS					
Existing Conditions	Existing Structure Type: <input type="checkbox"/> Bridge span <input type="checkbox"/> Pipe arch <input type="checkbox"/> Open-bottom culvert <input type="checkbox"/> Closed-bottom culvert <input checked="" type="checkbox"/> Closed-bottom culvert with stream simulation <input type="checkbox"/> Other: <input type="text"/>				
	Existing Crossing Span: <i>(perpendicular to flow)</i>		Culvert Diameter:		
	Existing Crossing Length: <i>(parallel to flow)</i>		Outlet Elevation:		
	8 feet		5 feet		
			El. 495.27 feet		
	29.5 feet		El. 494.70 feet		
			0.019		
Proposed Conditions	Proposed Structure Type:	Tier 1	Tier 2	Tier 3	Alternative Design
	Bridge Span	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Pipe Arch	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
	Closed-bottom Culvert	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
	Open-bottom Culvert	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Closed-bottom Culvert with stream simulation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Proposed Structure Span: <i>(perpendicular to flow)</i>	Culvert Diameter:			
	8 feet	7 feet			
	Proposed Structure Length: <i>(parallel to flow)</i>	Inlet Elevation:			
	36 feet	El. 493.77 feet			
Proposed Structure Length: <i>(parallel to flow)</i>		Outlet Elevation:			
36 feet		El. 493.41 feet			
Proposed Structure Length: <i>(parallel to flow)</i>		Culvert Slope:			
36 feet		0.01			
Proposed Entrenchment Ratio:* 1.3-1.9 <i>For Tier 2, Tier 3 and Tier 4 Crossings Only. To accommodate the entrenchment ratio, floodplain drainage structures may be utilized.</i>					

* Note: Proposed Entrenchment Ratio must meet the minimum ratio for each stream type listed in **Figure 3**, otherwise the applicant must address the Alternative Design criteria listed in Env-Wt 904.10.

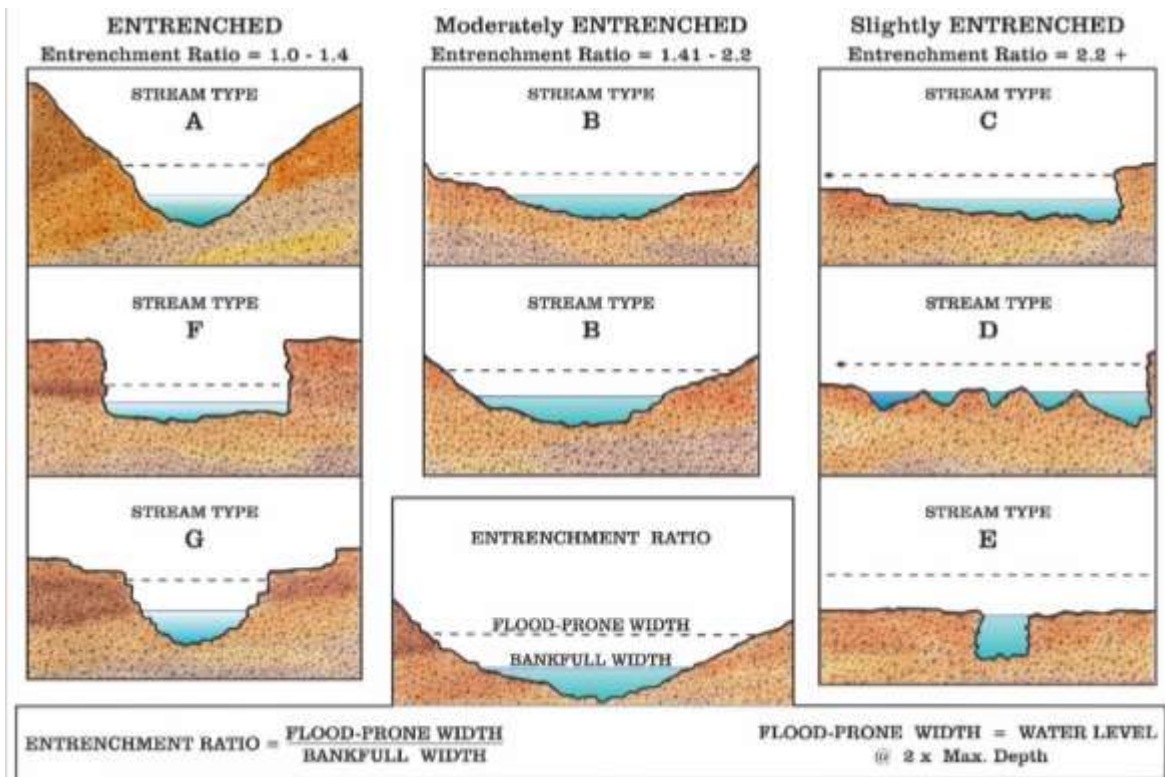


Figure 3: Reference from Applied River Morphology, Rosgen, 1996.

SECTION 11 - CROSSING STRUCTURE HYDRAULICS		
	Existing	Proposed
100 year flood stage elevation at inlet:	503.50	503.15
Flow velocity at outlet in feet per second (FPS):	11.23	11.77
Calculated 100 year peak discharge (Q) for the <i>proposed</i> structure in CFS:		470.99
Calculated 50 year peak discharge (Q) for the <i>proposed</i> structure in CFS:		386.08
SECTION 12 - CROSSING STRUCTURE OPENNESS RATIO		
For <i>tier 2</i> , <i>tier 3</i> and <i>tier 4</i> crossings only.		
Crossing Structure Openness Ratio* = 1.11		
* Openness box culvert = (height x width)/length		
Openness round culvert = (3.14 x radius ²)/length		
SECTION 13 - GENERAL DESIGN CONSIDERATIONS		
Env-Wt 904.01 requires all stream crossings to be designed and constructed according to the following requirements. Check each box if the project meets these general design considerations.		
All stream crossings shall be designed and constructed so as to:		
<input checked="" type="checkbox"/> Not be a barrier to sediment transport.		
<input checked="" type="checkbox"/> Prevent the restriction of high flows and maintain existing low flows.		
<input checked="" type="checkbox"/> Not obstruct or otherwise substantially disrupt the movement of aquatic life indigenous to the waterbody beyond the actual duration of construction.		
<input checked="" type="checkbox"/> Not cause an increase in the frequency of flooding or overtopping of banks.		
<input checked="" type="checkbox"/> Maintain or enhance geomorphic compatibility by:		

a. Minimizing the potential for inlet obstruction by sediment, wood, or debris, and

b. Preserving the natural alignment of the stream channel.

☒ Preserve watercourse connectivity where it currently exists.

☐ Restore watercourse connectivity where:

a. Connectivity previously was disrupted as a result of human activity(ies), and

b. Restoration of connectivity will benefit aquatic life upstream or downstream of the crossing, or both.

☒ Not cause erosion, aggradation, or scouring upstream or downstream of the crossing.

☒ Not cause water quality degradation.

SECTION 14 - TIER-SPECIFIC DESIGN CRITERIA

Stream crossings must be designed in accordance with the tier specific design criteria listed in Part Env-Wt 904.

☐ The proposed project meets the tier specific design criteria listed in Part Env-Wt 904 and each requirement has been addressed in the plans and as part of the wetland application.

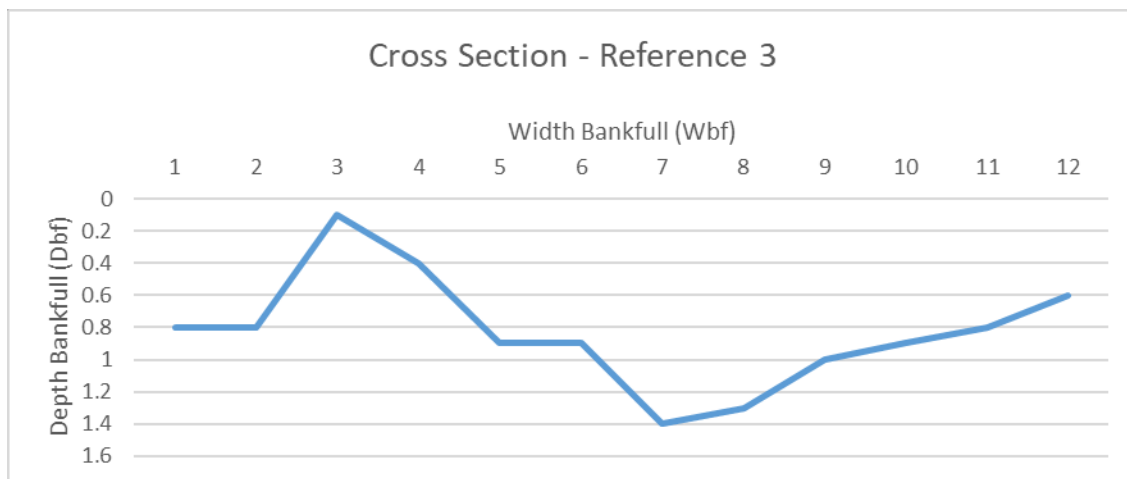
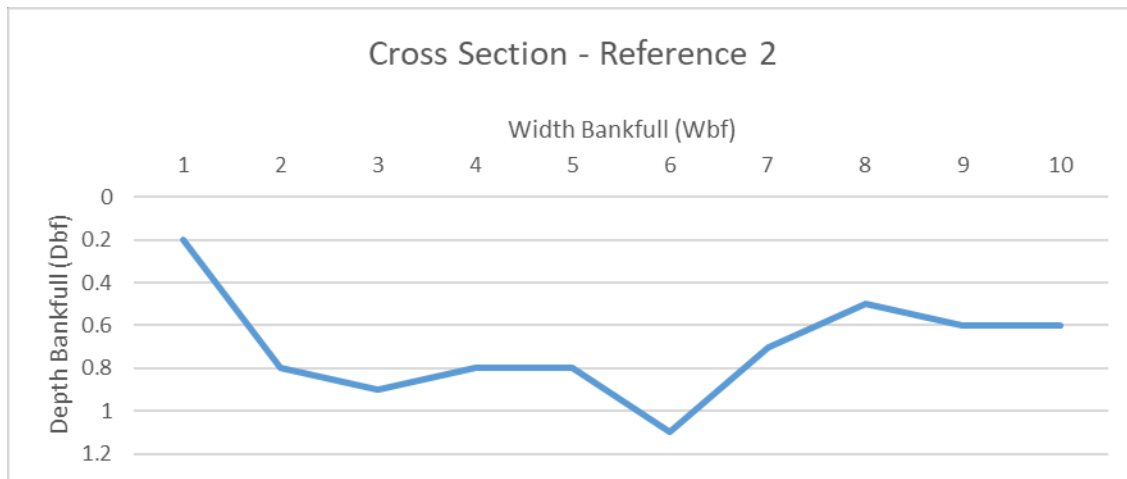
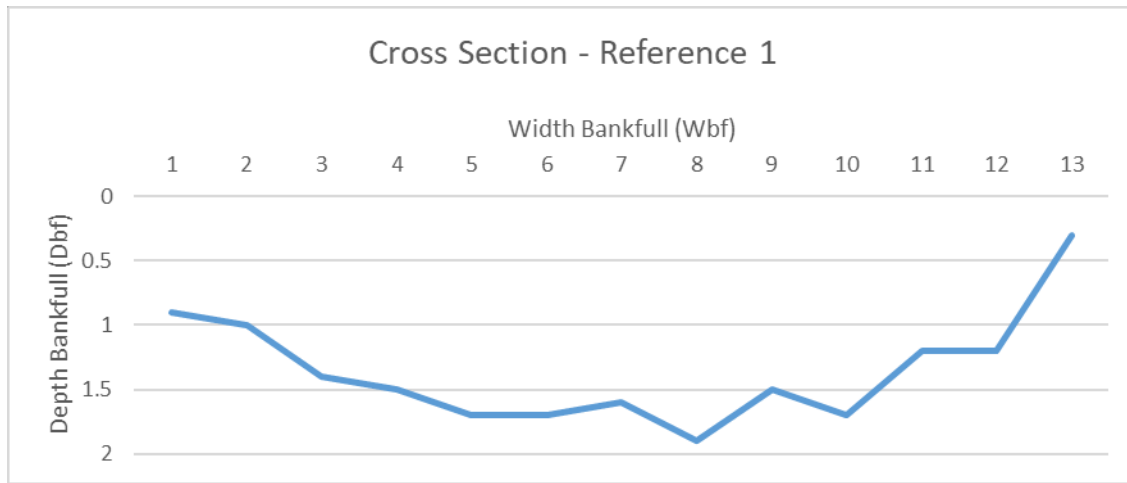
SECTION 15 - ALTERNATIVE DESIGN

NOTE: If the proposed crossing does not meet all of the general design considerations, the tier specific design criteria, or the minimum entrenchment ratio for each given stream type listed in **Figure 3**, then an alternative design plan and associated requirements must be addressed pursuant to Env-Wt 904.10.

☒ I have submitted an alternative design and addressed each requirement listed in Env-Wt 904.10.

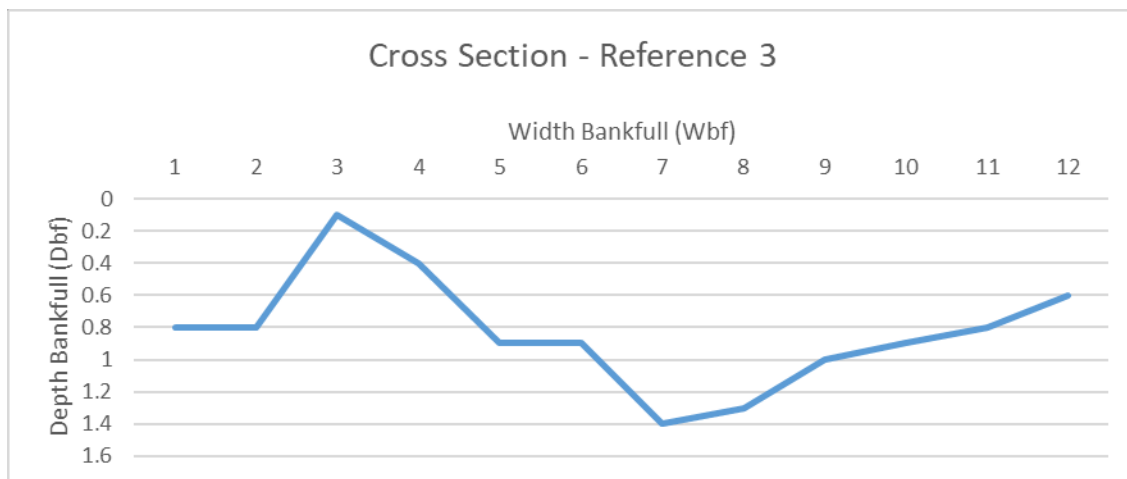
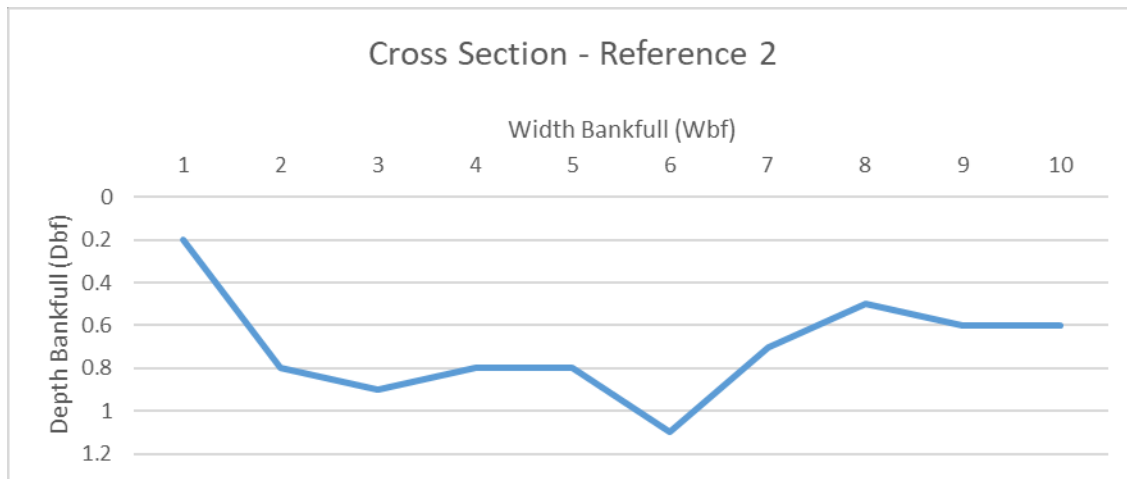
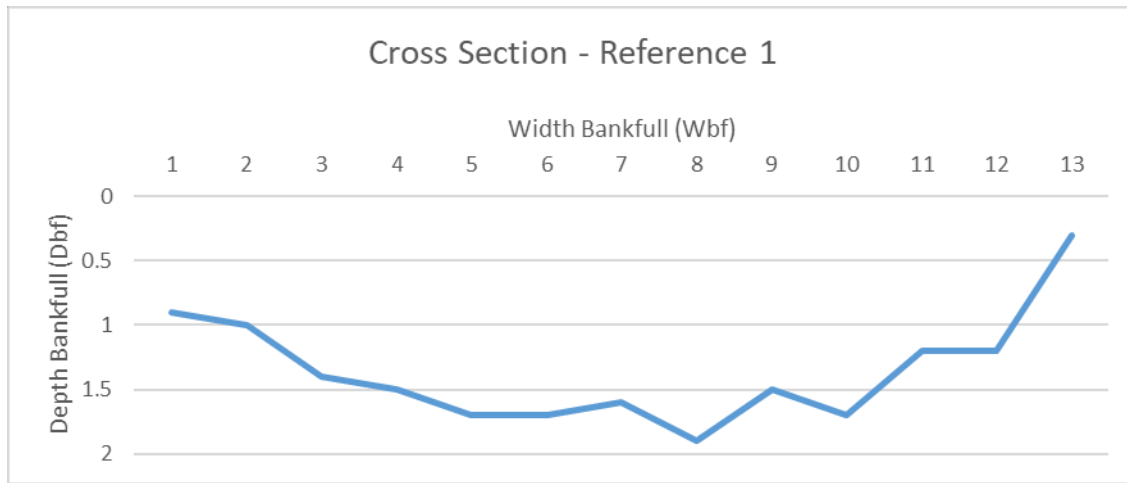
Eaton, 1832-H-1

Culvert Replacement Stream Crossing Assessment. NH 153 over un-named tributary to Crystal Lake



Eaton, 1832-H-1

Culvert Replacement Stream Crossing Assessment. NH 153 over un-named tributary to Crystal Lake





Outlet Looking Upstream



Inlet Looking Downstream



Reference Reach 1



Reference Reach 2



Reference Reach 3

Bureau of Environment

Stream Crossing Assessment Report

Project: Eaton 1832H-1

Tier: 3

Assessment completed by: Matt Urban, Meli Dube, Kerry Ryan

Date assessment completed: 5/22/16

Rosgen Stream Classification At Crossing: "E" **Type B based on inlet**

Rosgen Stream Classification In Reach: "B"

Watershed Size (acres): 857.6

Average Bankfull Width in Reach: 11.7'

Environmental consideration resulting in Tier 3 classification? ☐ Yes ☒ No

If yes, what is the consideration? Tier 3 classification based on watershed size; NHB search was not performed at the time of the assessment

Can it be mitigated down to watershed-based tier? ☐ Yes ☐ No

If yes, how? N/A

Special considerations based on Rosgen Stream Type (from the NH Stream Crossing Guidelines):

Type E channels are relatively stable, sinuous channels with very wide flood plains. The stream banks and flood plains are usually well vegetated, often with wetland plant species. Entrenchment ratios can be as high as 100 in broad, unconfined valleys. This high entrenchment ratio is difficult to accommodate with a single stream crossing structure. The least impacting approach to crossing an E type stream would be a bridge or piered structure that spans the flood-prone area. However, the costs associated with this approach may be prohibitive, and thus it is recommended that crossings not be located on Type E channels.

Two important considerations when designing a crossing of an E type stream are preserving the width/depth ratio of the stream channel and maintaining access to flood plains. Type E channels are stable, but vulnerable to disturbance, and can rapidly change into different channel types if stream channel dimensions are altered. It is highly recommended that crossings of Type E channels be at a minimum width of 1.2 times bankfull width plus 2 feet and that flood plain culverts at bankfull elevation be used to avoid constricting flood flows through the main channel. If the stream channel must be rebuilt within a structure, it is important to maintain the natural width/depth ratio to avoid destabilizing the stream.

Type B streams display moderate sinuosity, slope, width/depth ratios, and entrenchment. This generally stable stream type commonly consists of riffles and rapids and occasional scour pools. Type B streams are often found in forested areas with flood plain vegetation moderately influencing channel stability. Streambank erosion is typically considered low and sensitivity to disturbance is often low to moderate. Fish habitat in this channel type is often attributed to scour pools developed by large woody material.

Stream crossings commonly occur over B and C type channels in New Hampshire because they tend to occur in valleys that are conducive to road building and development. From a stream crossing perspective, B type streams are a transition in design issues between A and C type streams. Approaches to crossing a B type stream vary with the size of the flood plain. At one end of the spectrum are B type streams with lower entrenchment ratios (1.4). The relatively narrow flood-prone area may be accommodated with a single opening. At the other end of the spectrum are the B type streams with entrenchment ratios of up to 2.1. These streams behave more like C type streams, with lower slopes and wider flood plains. The flood-prone area in relation to the bankfull width may be too wide for a single opening and should be either spanned or accommodated with flood plain drainage structures. In either case, an analysis of bedload capacity will ensure that the structure design will not impact sediment transport capacity through the stream reach.

The design elements checked below are required by the NHDES Stream Crossing Rules for the subject stream crossing. If the project cannot incorporate these design elements, the permit application must include a Technical Report for an alternative design pursuant to Env-Wt 904.09. Please contact the Bureau of Environment for further guidance.

Required design elements:

- ☒ Structure size: $1.2 \times \text{Bankfull Width} + 2' = 16'$ Type B entrenchment ratio multiplier= 1.4
 $11.7 \times 1.4 = 16.4'$
- ☐ Span-structure or 3-sided culvert (not a closed structure)
- ☒ Embedded culvert or pipe arch
- ☒ Simulation of a natural stream channel through the structure (This would be based in part on the attached longitudinal profile, average bankfull dimensions of the reference reach, and existing substrate.)
- ☒ Bed forms and streambed characteristics necessary to maintain comparable water depths and velocities through the structure as occur upstream and downstream.
- ☒ Vegetated bank on both sides of the watercourse
- ☒ Accommodate 100-year flood and sediment transport
- ☒ Preservation of natural alignment and gradient of stream channel.

Notes:



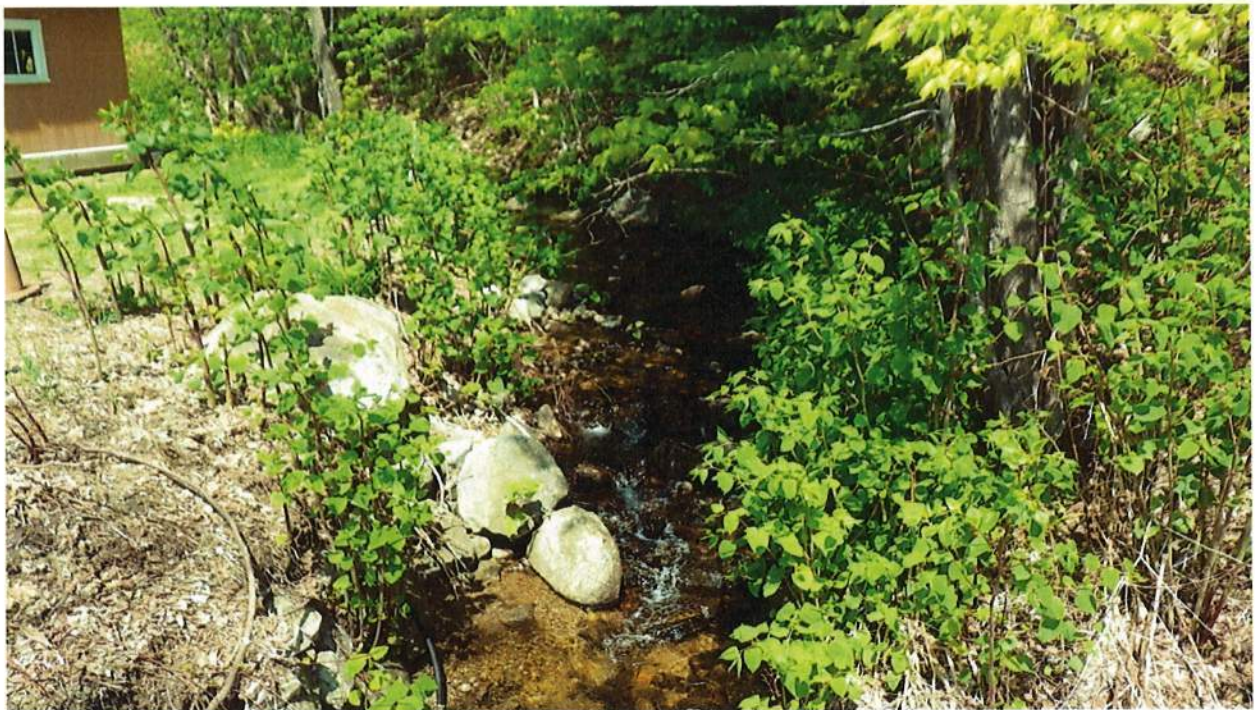
Downstream



Downstream (Past Patch of Knottweed)



Downstream Looking Upstream Towards Structure



Upstream



Upstream Looking Downstream Towards The Structure



Reference Reach 1

Eaton



0 10 20 40 Feet

Eaton



0 40 80 160 Feet

New Hampshire Natural Heritage Bureau

NHB DataCheck Results Letter

To: Arin Mills
John O. Morton Building
7 Hazen Drive
Concord, NH 03302-0483

From: NH Natural Heritage Bureau

Date: 3/16/2021 (This letter is valid through 3/16/2022)

Re: Review by NH Natural Heritage Bureau of request dated 3/16/2021

Permit Types: Wetland Standard Dredge & Fill - Major
General Permit

NHB ID: NHB21-0911

Applicant: Arin Mills

Location: Eaton
Tax Map: DOT ROW, Tax Lot: DOT ROW
Address: NH 153 over un-named tributary to Crystal Lake

Proj. Description: Work will include replacement of existing stone culvert which carries NH 153 over an un-named tributary to Crystal Lake. At this time the design is still under development, although it is intended the culvert will be replaced. Previous wetland permit 2016-03053 for repairs was not constructed, with previous review NHB16-1993.

The NH Natural Heritage database has been checked for records of rare species and exemplary natural communities near the area mapped below. The species considered include those listed as Threatened or Endangered by either the state of New Hampshire or the federal government. We currently have no recorded occurrences for sensitive species near this project area.

A negative result (no record in our database) does not mean that a sensitive species is not present. Our data can only tell you of known occurrences, based on information gathered by qualified biologists and reported to our office. However, many areas have never been surveyed, or have only been surveyed for certain species. An on-site survey would provide better information on what species and communities are indeed present.

New Hampshire Natural Heritage Bureau
NHB DataCheck Results Letter

MAP OF PROJECT BOUNDARIES FOR: NHB21-0911





United States Department of the Interior



FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
<http://www.fws.gov/newengland>

In Reply Refer To:
Consultation Code: 05E1NE00-2021-SLI-1961
Event Code: 05E1NE00-2021-E-06206
Project Name: Eaton 1832H-1 Culvert Replacement

March 22, 2021

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at:

<http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>;

<http://www.towerkill.com>; and

[http://](http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html)

www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office

70 Commercial Street, Suite 300

Concord, NH 03301-5094

(603) 223-2541

Project Summary

Consultation Code: 05E1NE00-2021-SLI-1961

Event Code: 05E1NE00-2021-E-06206

Project Name: Eaton 1832H-1 Culvert Replacement

Project Type: TRANSPORTATION

Project Description: NH153 over unnamed brook approx. 450 feet north of Ridge Road and Glines Road. Work will be to replace and extend the existing stone culvert, installation of wingwalls and guardrail. Project will address deterioration of the crossing and improve safety. Previous 2016 review (05E1NE00-2016-SLI-1666) for rehabilitation was not constructed, and this project will propose to replace the existing crossing.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@43.910704100000004,-71.08076768085479,14z>



Counties: Carroll County, New Hampshire

Endangered Species Act Species

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Flowering Plants

NAME	STATUS
Small Whorled Pogonia <i>Isotria medeoloides</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1890	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.



United States Department of the Interior



FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
<http://www.fws.gov/newengland>

IPaC Record Locator: 279-100430571

March 22, 2021

Subject: Consistency letter for the 'Eaton 1832H-1 Culvert Replacement' project indicating that any take of the northern long-eared bat that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o).

Dear Arin Mills:

The U.S. Fish and Wildlife Service (Service) received on March 22, 2021 your effects determination for the 'Eaton 1832H-1 Culvert Replacement' (the Action) using the northern long-eared bat (*Myotis septentrionalis*) key within the Information for Planning and Consultation (IPaC) system. You indicated that no Federal agencies are involved in funding or authorizing this Action. This IPaC key assists users in determining whether a non-Federal action may cause “take”^[1] of the northern long-eared bat that is prohibited under the Endangered Species Act of 1973 (ESA) (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.).

Based upon your IPaC submission, any take of the northern long-eared bat that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o). Unless the Service advises you within 30 days of the date of this letter that your IPaC-assisted determination was incorrect, this letter verifies that the Action is not likely to result in unauthorized take of the northern long-eared bat.

Please report to our office any changes to the information about the Action that you entered into IPaC, the results of any bat surveys conducted in the Action area, and any dead, injured, or sick northern long-eared bats that are found during Action implementation.

If your Action proceeds as described and no additional information about the Action’s effects on species protected under the ESA becomes available, no further coordination with the Service is required with respect to the northern long-eared bat.

The IPaC-assisted determination for the northern long-eared bat **does not** apply to the following ESA-protected species that also may occur in your Action area:

- Small Whorled Pogonia *Isotria medeoloides* Threatened

You may coordinate with our Office to determine whether the Action may cause prohibited take of the animal species listed above.

[1]Take means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct [ESA Section 3(19)].

Action Description

You provided to IPaC the following name and description for the subject Action.

1. Name

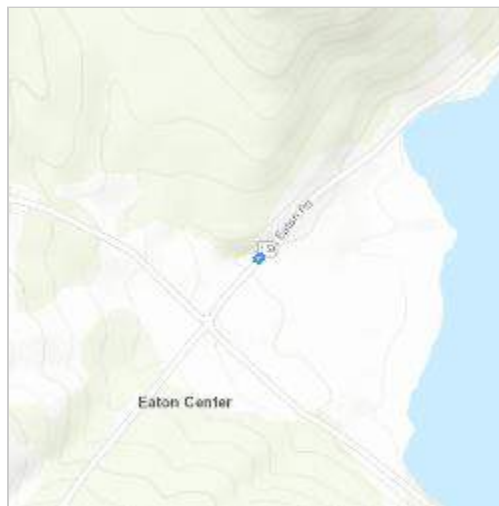
Eaton 1832H-1 Culvert Replacement

2. Description

The following description was provided for the project 'Eaton 1832H-1 Culvert Replacement':

NH153 over unnamed brook approx. 450 feet north of Ridge Road and Glines Road. Work will be to replace and extend the existing stone culvert, installation of wingwalls and guardrail. Project will address deterioration of the crossing and improve safety. Previous 2016 review (05E1NE00-2016-SLI-1666) for rehabilitation was not constructed, and this project will propose to replace the existing crossing.

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@43.910704100000004,-71.08076768085479,14z>

**Determination Key Result**

This non-Federal Action may affect the northern long-eared bat; however, any take of this species that may occur incidental to this Action is not prohibited under the final 4(d) rule at 50 CFR §17.40(o).

Determination Key Description: Northern Long-eared Bat 4(d) Rule

This key was last updated in IPaC on **May 15, 2017**. Keys are subject to periodic revision.

This key is intended for actions that may affect the threatened northern long-eared bat.

The purpose of the key for non-Federal actions is to assist determinations as to whether proposed actions are excepted from take prohibitions under the northern long-eared bat 4(d) rule.

If a non-Federal action may cause prohibited take of northern long-eared bats or other ESA-listed animal species, we recommend that you coordinate with the Service.

Determination Key Result

Based upon your IPaC submission, any take of the northern long-eared bat that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o).

Qualification Interview

1. Is the action authorized, funded, or being carried out by a Federal agency?

No

2. Will your activity purposefully **Take** northern long-eared bats?

No

3. [Semantic] Is the project action area located wholly outside the White-nose Syndrome Zone?

Automatically answered

No

4. Have you contacted the appropriate agency to determine if your project is near a known hibernaculum or maternity roost tree?

Location information for northern long-eared bat hibernacula is generally kept in state Natural Heritage Inventory databases – the availability of this data varies state-by-state. Many states provide online access to their data, either directly by providing maps or by providing the opportunity to make a data request. In some cases, to protect those resources, access to the information may be limited. A web page with links to state Natural Heritage Inventory databases and other sources of information on the locations of northern long-eared bat roost trees and hibernacula is available at www.fws.gov/midwest/endangered/mammals/nleb/nhisites.html.

Yes

5. Will the action affect a cave or mine where northern long-eared bats are known to hibernate (i.e., hibernaculum) or could it alter the entrance or the environment (physical or other alteration) of a hibernaculum?

No

6. Will the action involve Tree Removal?

Yes

7. Will the action only remove hazardous trees for the protection of human life or property?

No

8. Will the action remove trees within 0.25 miles of a known northern long-eared bat hibernaculum at any time of year?

No

9. Will the action remove a known occupied northern long-eared bat maternity roost tree or any trees within 150 feet of a known occupied maternity roost tree from June 1 through July 31?

No

Project Questionnaire

If the project includes forest conversion, report the appropriate acreages below. Otherwise, type '0' in questions 1-3.

1. Estimated total acres of forest conversion:

.1

2. If known, estimated acres of forest conversion from April 1 to October 31

.1

3. If known, estimated acres of forest conversion from June 1 to July 31

.1

If the project includes timber harvest, report the appropriate acreages below. Otherwise, type '0' in questions 4-6.

4. Estimated total acres of timber harvest

0

5. If known, estimated acres of timber harvest from April 1 to October 31

0

6. If known, estimated acres of timber harvest from June 1 to July 31

0

If the project includes prescribed fire, report the appropriate acreages below. Otherwise, type '0' in questions 7-9.

7. Estimated total acres of prescribed fire

0

8. If known, estimated acres of prescribed fire from April 1 to October 31

0

9. If known, estimated acres of prescribed fire from June 1 to July 31

0

If the project includes new wind turbines, report the megawatts of wind capacity below. Otherwise, type '0' in question 10.

10. What is the estimated wind capacity (in megawatts) of the new turbine(s)?

0

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENVIRONMENT

NOTE TO FILE

Date: June 2, 2021

From: Arin Mills
Senior Environmental Manager
Bureau of Environment

Project: Eaton Culvert Replacement, 1832-H-1

RE: Small Whorled Pogonia Field Review

The above referenced project is proposed to conduct replacement of an existing 8'W X 55"H box culvert with an embedded precast concrete box. To improve safety the new culvert will be extended on both the inlet and outlet to increase the shoulder width, and new wingwalls will be installed.

On June 1, 2021 the project location was visited for evaluation of potential Small whorled pogonia habitat within the area of disturbance. The area surrounding the crossing is a managed right-of-way, with dense Japanese knotweed growth surrounding all sides of the crossing. The Knotweed was very dense in the NE, NW and SW quadrants, creating a monoculture stand with no other herbaceous species present. The SE quadrant has knotweed present, although less dense with a thin forested buffer surrounding the stream. A review of the SE quadrant found a riparian buffer species composition consisting of an over story of Ash with a shrub layer of Ask saplings, Spicebush and Elm and an herbaceous layer of Braken fern, Poison Ivy, Aster, and Knotweed. A review of the habitat for Small whorled pogonia is old hardwood stands of beech, birch, maple, oak and hickory with an open understory, as determined by the US Fish & Wildlife Service. No habitat for the species or individual plants were observed during the site visit. No impacts to the species are anticipated from the project.

Arin Mills
Environmental Manager
NH Department of Transportation



Photo 1: Inlet looking downstream toward NH 153

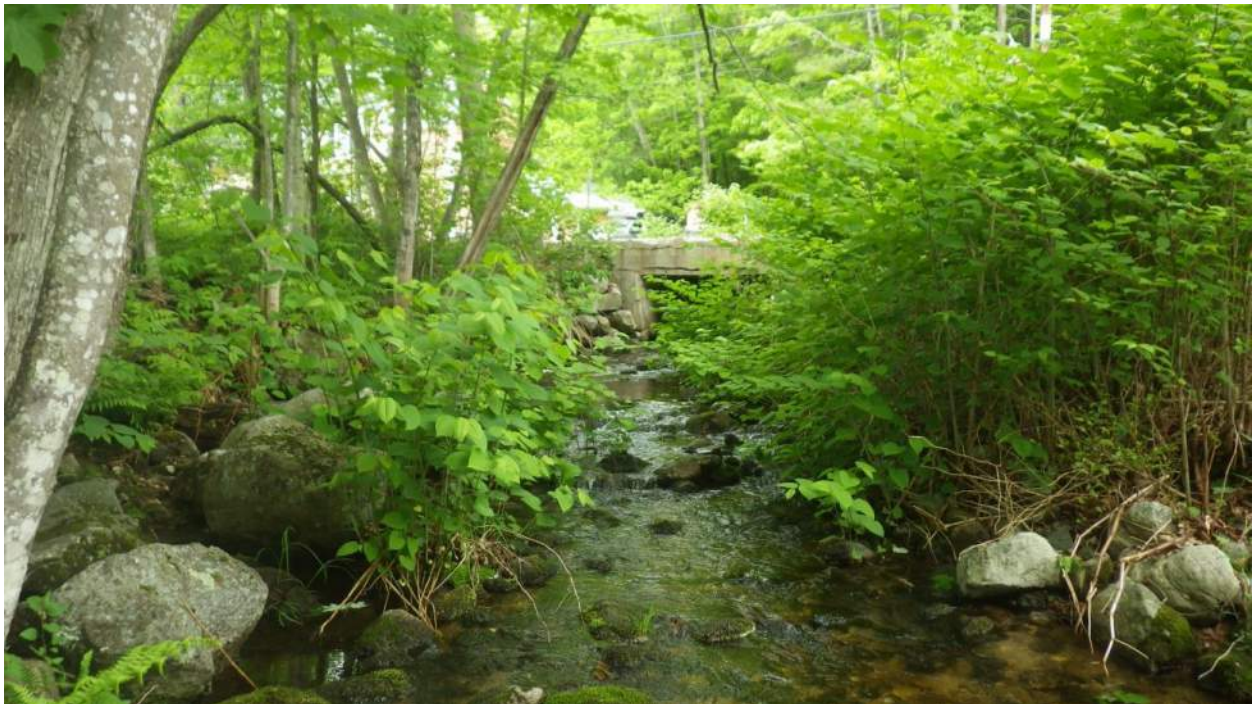


Photo 2: Outlet looking upstream toward NH 153

Appendix B Certification – Activities with Minimal Potential to Cause Effects**Date Reviewed:** 5/20/2021

(Desktop or Field Review Date)

☒ This Project uses only State funding; however project activities listed below comply with the PA.
Project Name: Eaton Culvert Replacement**State Number:** 1832-H-1**FHWA Number:** [Click here to enter text.](#)**Environmental Contact:** Arin Mills**DOT****Email Address:** Arin.j.mills@dot.nh.gov**Project Manager:** [Click here to enter text.](#)

Project Description: Replace existing stone culvert with longer precast 8' x 55" concrete box culvert and wingwalls and install guardrail along the roadway. The culvert conveys surface waters to Crystal Lake and is physically located approximately 450 LF from the intersection of NH Route 153, Ridge Road, and Glines Hill Road.

Please select the applicable activity/activities:

Highway and Roadway Improvements	
<input type="checkbox"/>	1. Modernization and general highway maintenance <u>that may require additional highway right-of-way or easement</u> , including: Choose an item. Choose an item.
<input type="checkbox"/>	2. Installation of rumble strips or rumble stripes
<input type="checkbox"/>	3. Installation or replacement of pole-mounted signs
<input type="checkbox"/>	4. Guardrail replacement, provided any extension does not connect to a bridge older than 50 years old (unless it does already), and there is no change in access associated with the extension
Bridge and Culvert Improvements	
<input type="checkbox"/>	5. Culvert replacement (excluding stone box culverts), when the culvert is less than 60" in diameter and excavation for replacement is limited to previously disturbed areas
<input type="checkbox"/>	6. Bridge deck preservation and replacement, as long as no character defining features are impacted
<input checked="" type="checkbox"/>	7. Non-historic bridge and culvert maintenance, renovation, or total replacement, <u>that may require minor additional right-of-way or easement</u> , including: a. replacement or maintenance of non-historic bridges Choose an item.
<input type="checkbox"/>	8. Historic bridge maintenance activities within the limits of existing right-of-way, including: Choose an item. Choose an item.
<input type="checkbox"/>	9. Stream and/or slope stabilization and restoration activities (including removal of debris or sediment obstructing the natural waterway, or any non-invasive action to restore natural conditions)
Bicycle and Pedestrian Improvements	
<input type="checkbox"/>	10. Construction of pedestrian walkways, sidewalks, sidewalk tip-downs, small passenger shelters, and alterations to facilities or vehicles in order to make them accessible for elderly and handicapped persons
<input type="checkbox"/>	11. Installation of bicycle racks
<input type="checkbox"/>	12. Recreational trail construction
<input type="checkbox"/>	13. Recreational trail maintenance when done on existing alignment
<input type="checkbox"/>	14. Construction of bicycle lanes and shared use paths and facilities within the existing right-of-way
Railroad Improvements	
<input type="checkbox"/>	15. Modernization, maintenance, and safety improvements of railroad facilities within the existing railroad or highway right-of-way, <u>provided no historic railroad features are impacted</u> , including, but not limited to: Choose an item.

Section 106 Programmatic Agreement – Cultural Resources Review Effect Finding

Appendix B Certification – Activities with Minimal Potential to Cause Effects

	Choose an item.
<input type="checkbox"/>	16. In-kind replacement of modern railroad features (i.e. those features that are less than 50 years old)
<input type="checkbox"/>	17. Modernization/modification of railroad/roadway crossings provided that all work is undertaken within the limits of the roadway structure (edge of roadway fill to edge of roadway fill) and no associated character defining features are impacted
Other Improvements	
<input type="checkbox"/>	18. Installation of Intelligent Transportation Systems
<input type="checkbox"/>	19. Acquisition or renewal of scenic, conservation, habitat, or other land preservation easements where no construction will occur
<input type="checkbox"/>	20. Rehabilitation or replacement of existing storm drains.
<input type="checkbox"/>	21. Maintenance of stormwater treatment features and related infrastructure

Please describe how this project is applicable under Appendix B of the Programmatic Agreement.


This project was previously reviewed by DOT and DHR for work to include repair to the existing structure in 2016. The repair work was not completed, and in 2020 District determined the project would now be replacement of the existing box culvert. An RPR for repair was sent to DHR and on July 6, 2016 (R&C #7898) the DHR concurred the structure was not considered historic due to the extensive alteration to the stone culvert core, and no archaeological survey was necessary. No cultural concerns were noted. Based on this information it is further determined that the current proposed project to replace the existing structure will not result in a historic or archaeological effect. No further coordination with DHR is required as the current project aligns with the Section 106 Programmatic Agreement under Appendix B.

Please submit this Certification Form along with the Transportation RPR, including photographs, USGS maps, design plans and as-built plans, if available, for review. Note: The RPR can be waived for in-house projects, please consult Cultural Resources Program Staff.

Coordination Efforts:

Has an RPR been submitted to NHDOT for this project?	Yes	NHDHR R&C # assigned?	<u>7898</u>
Please identify public outreach effort contacts; method of outreach and date:	<u>Initial contact letter sent to town officials, including Historical Society, on 6/23/2016 and no response relating to historic resources was received.</u>		

Finding: (To be filled out by NHDOT Cultural Resources Staff)

<input checked="" type="checkbox"/>	No Potential to Cause Effects	<input type="checkbox"/>	No Historic Properties Affected
This finding serves as the Section 106 Memorandum of Effect. No further coordination is necessary.			
<input type="checkbox"/>	This project does <i>not</i> comply with Appendix B. Review will continue under Stipulation VII of the Programmatic Agreement. Please contact NHDOT Cultural Resources Staff to determine next steps.		
NHDOT comments:			
		5/20/2021	
_____ NHDOT Cultural Resources Staff		_____ Date	

Section 106 Programmatic Agreement – Cultural Resources Review Effect Finding

Appendix B Certification – Activities with Minimal Potential to Cause Effects

Coordination of the Section 106 process should begin as early as possible in the planning phase of the project (undertaking) so as not to cause a delay.

Project sponsors should not predetermine a Section 106 finding under the assumption a project is limited to the activities listed in Appendix B until this form is signed by the NHDOT Bureau of Environment Cultural Resources Program staff.

Every project shall be coordinated with, and reviewed by the NHDOT-BOE Cultural Resources Program in accordance with the *Programmatic Agreement Among the Federal Highway Administration, the New Hampshire State Historic Preservation Office, the Army Corps of Engineers, New England District, the Advisory Council on Historic Preservation, and the New Hampshire Department of Transportation Regarding the Federal Aid Highway Program in New Hampshire*. In accordance with the Advisory Council's regulations, we will continue to consult, as appropriate, as this project proceeds.

NHDOT and the State Historic Preservation Office may use provisions of the Programmatic Agreement to address the applicable requirements of NH RSA 227-C:9 in the location, identification, evaluation and management of historic resources, for projects funded by State funds.

If any portion of the project is not entirely limited to any one or a combination of the activities specified in Appendix B (with, or without the inclusion of any activities listed in Appendix A), please continue discussions with NHDOT Cultural Resources staff.

This No Potential to Cause Effect or No Historic Properties Affected project determination is your Section 106 finding, as defined in the Programmatic Agreement.

Should project plans change, please inform the NHDOT Cultural Resources staff in accordance with Stipulation VII of the Programmatic Agreement.



**US Army Corps
of Engineers®**
New England District

**New Hampshire General Permits (GPs)
Appendix B - Corps Secondary Impacts Checklist
(for inland wetland/waterway fill projects in New Hampshire)**

1. Attach any explanations to this checklist. Lack of information could delay a Corps permit determination.
2. All references to “work” include all work associated with the project construction and operation. Work includes filling, clearing, flooding, draining, excavation, dozing, stumping, etc.
3. See GC 5, regarding single and complete projects.
4. Contact the Corps at (978) 318-8832 with any questions.

1. Impaired Waters	Yes	No
1.1 Will any work occur within 1 mile upstream in the watershed of an impaired water? See http://des.nh.gov/organization/divisions/water/wmb/section401/impaired_waters.htm to determine if there is an impaired water in the vicinity of your work area.*		X
2. Wetlands	Yes	No
2.1 Are there are streams, brooks, rivers, ponds, or lakes within 200 feet of any proposed work?	X	
2.2 Are there proposed impacts to SAS, special wetlands. Applicants may obtain information from the NH Department of Resources and Economic Development Natural Heritage Bureau (NHB) DataCheck Tool for information about resources located on the property at https://www2.des.state.nh.us/nhb_datacheck/ . The book Natural Community Systems of New Hampshire also contains specific information about the natural communities found in NH.		X
2.3 If wetland crossings are proposed, are they adequately designed to maintain hydrology, sediment transport & wildlife passage?	X	
2.4 Would the project remove part or all of a riparian buffer? (Riparian buffers are lands adjacent to streams where vegetation is strongly influenced by the presence of water. They are often thin lines of vegetation containing native grasses, flowers, shrubs and/or trees that line the stream banks. They are also called vegetated buffer zones.)		X
2.5 The overall project site is more than 40 acres?		X
2.6 What is the area of the previously filled wetlands?		
2.7 What is the area of the proposed fill in wetlands?		
2.8 What is the % of previously and proposed fill in wetlands to the overall project site?		
3. Wildlife	Yes	No
3.1 Has the NHB & USFWS determined that there are known occurrences of rare species, exemplary natural communities, Federal and State threatened and endangered species and habitat, in the vicinity of the proposed project? (All projects require an NHB ID number & a USFWS IPAC determination.) NHB DataCheck Tool: https://www2.des.state.nh.us/nhb_datacheck/ USFWS IPAC website: https://ecos.fws.gov/ipac/location/index		X

3.2 Would work occur in any area identified as either “Highest Ranked Habitat in N.H.” or “Highest Ranked Habitat in Ecological Region”? (These areas are colored magenta and green, respectively, on NH Fish and Game’s map, “2010 Highest Ranked Wildlife Habitat by Ecological Condition.”) Map information can be found at: <ul style="list-style-type: none"> • PDF: www.wildlife.state.nh.us/Wildlife/Wildlife_Plan/highest_ranking_habitat.htm. • Data Mapper: www.granit.unh.edu. • GIS: www.granit.unh.edu/data/downloadfreedata/category/databycategory.html. 		X
3.3 Would the project impact more than 20 acres of an undeveloped land block (upland, wetland/waterway) on the entire project site and/or on an adjoining property(s)?		X
3.4 Does the project propose more than a 10-lot residential subdivision, or a commercial or industrial development?		X
3.5 Are stream crossings designed in accordance with the GC 21?	X	
4. Flooding/Floodplain Values	Yes	No
4.1 Is the proposed project within the 100-year floodplain of an adjacent river or stream?	X	
4.2 If 4.1 is yes, will compensatory flood storage be provided if the project results in a loss of flood storage?		X
5. Historic/Archaeological Resources		
For a minimum, minor or major impact project - a copy of the Request for Project Review (RPR) Form (www.nh.gov/nhdhr/review) with your DES file number shall be sent to the NH Division of Historical Resources as required on Page 11 GC 8(d) of the GP document**	X	

*Although this checklist utilizes state information, its submittal to the Corps is a Federal requirement.

** If your project is not within Federal jurisdiction, coordination with NH DHR is not required under Federal law.

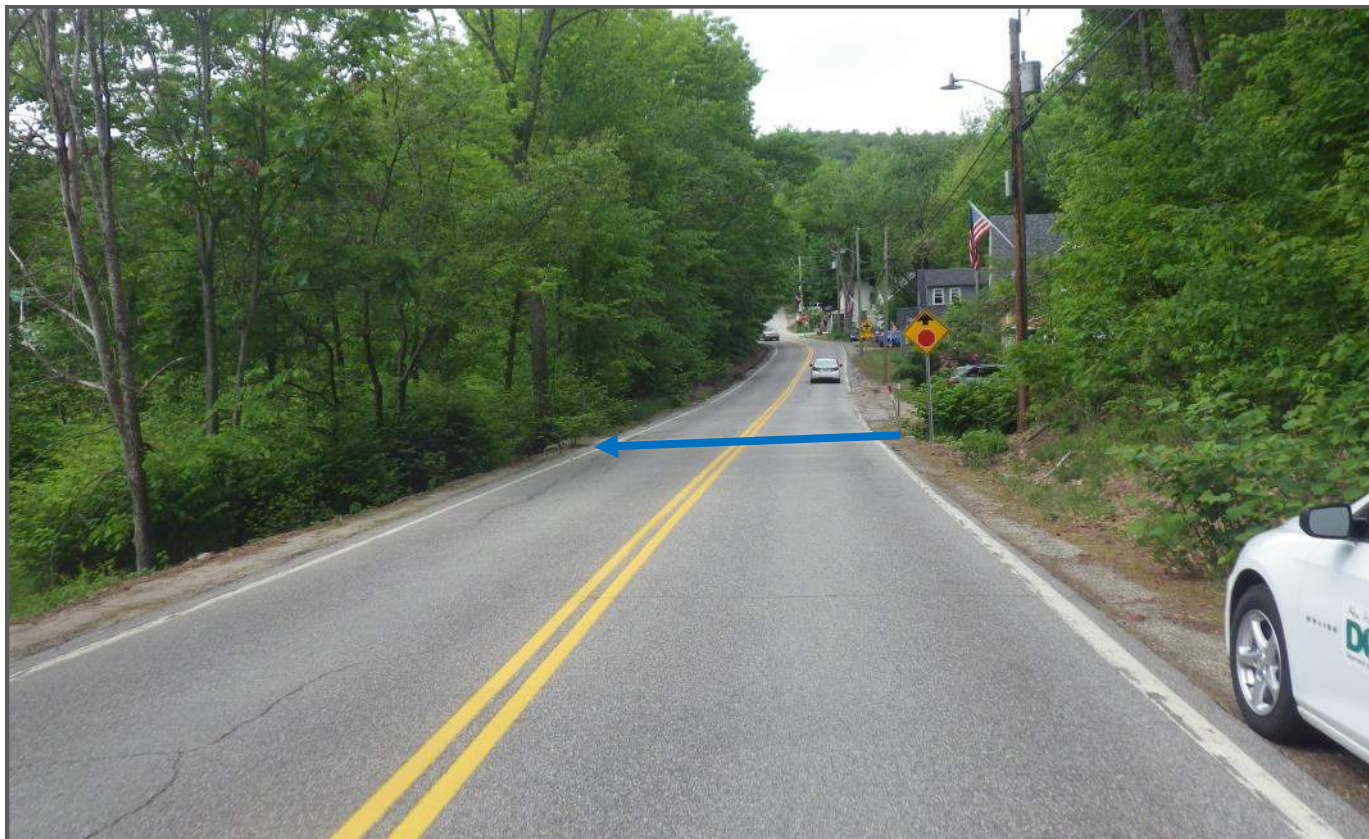


Photo 1: Looking SW down NH 153 toward Eaton Center



Photo 2: Looking NE down NH 153



Photo 3: Looking east (downstream) at inlet



Photo 4: Looking west (upstream) from NH 153



Photo 5: Looking west (upstream) at outlet



Photo 6: Looking east (downstream) from NH 153

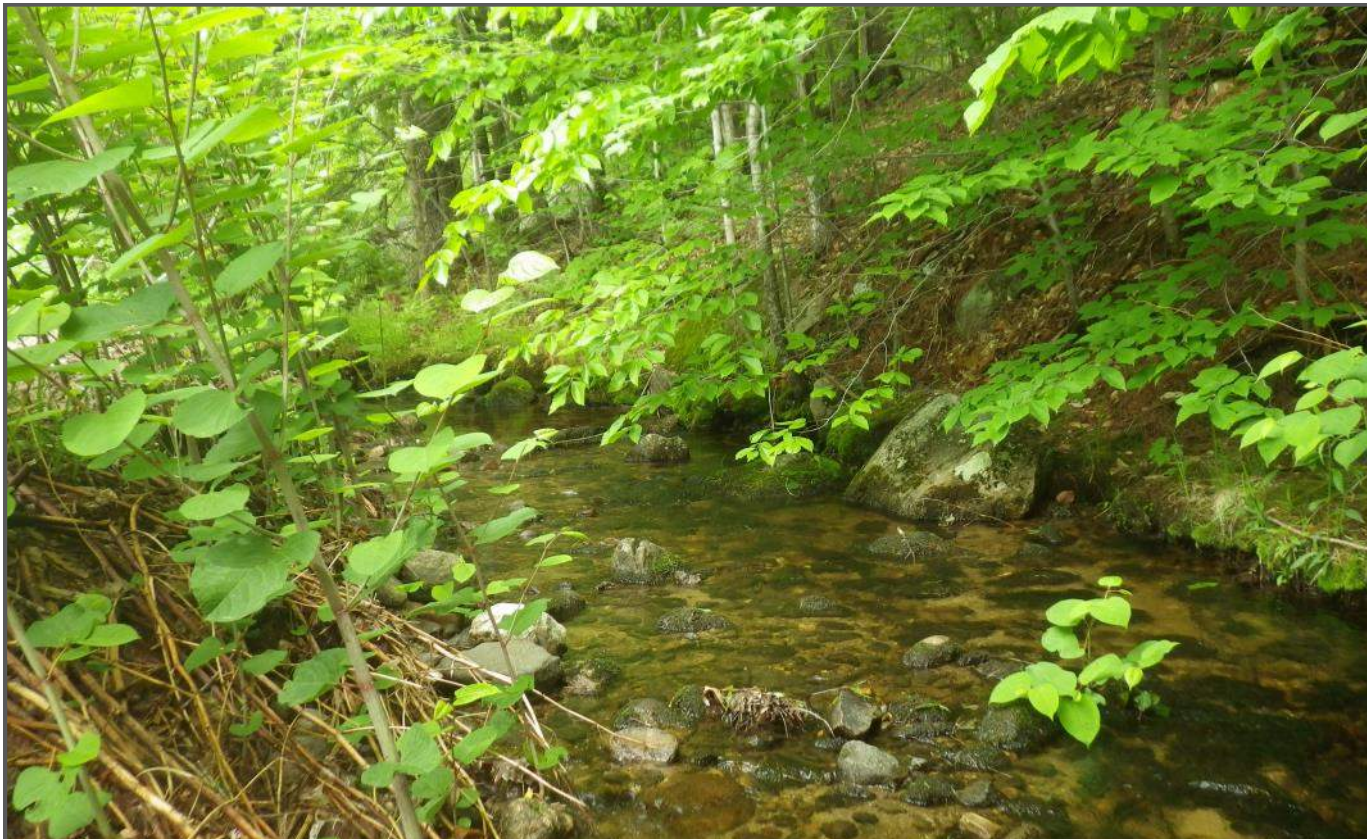


Photo 7: Looking upstream from inlet

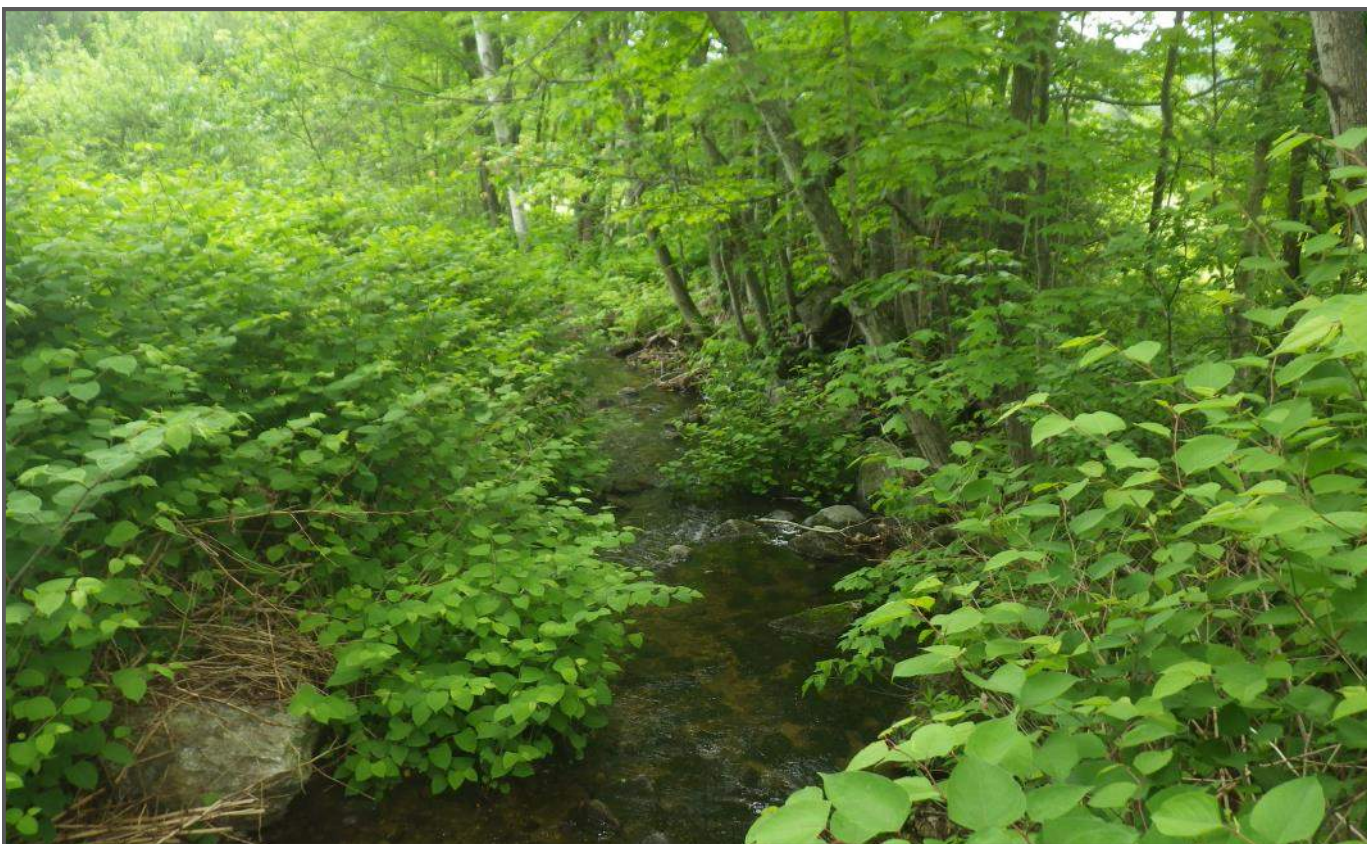


Photo 8: Looking downstream from outlet

CONSTRUCTION SEQUENCE

All construction activities shall closely follow the guidelines provided in “Best Management Practices for Routine Roadway Maintenance Activities in New Hampshire (2019)” for erosion control, and in “Best Management Practices for the Control of Invasive and Noxious Plant Species Manual (2018)” for invasive species control.

As a preventative measure, erosion control measures, such as turbidity barrier, silt fence, compost sock, and hay bales, will be placed parallel to the roadway, between the proposed work area and designated wet areas ahead of all construction activities.

The installation of the proposed box culvert will take place during low flow conditions, which is primarily in the summer/early fall months. All erosion control measures will be installed, monitored, repaired or replaced as needed to maintain water quality. These measures will not be removed until all impacted areas are stabilized. Work will be completed in 3 Steps.

Step 1 - Install the Water Diversion Structure (Clean Water Bypass, CWB)

A 36-inch diameter pipe will be used as a CWB so that the new permanent box culvert may be constructed at the same location as the existing culvert. The CWB has been sized to accommodate the 2-year design storm. The following summarizes the work to be completed during this step:

1. Install turbidity curtains on the upstream and downstream sides of the CWB pipe; the curtains should be placed to prevent any fines from entering into the existing stream.
2. Install sand bag cofferdams, to dewater the site, on the upstream and downstream sides of the CWB pipe within the area contained by the turbidity curtains.
3. Place a sediment basin on the downstream side of the roadway; locate the basin a minimum of 20-feet from any delineated wetland.
4. Connect the dewatering sump pump to the sediment basin and dewater the site.
5. Install the water diversion structure pipe using alternating two-way traffic patterns with flaggers; construct the pipe from the downstream side to the upstream side. This is a clean water bypass and does not require treatment. The clean water bypass pipe will be set at an elevation 1-foot above the invert of the existing culvert.
6. Remove the upstream and downstream sump pump, sand bag cofferdam, and turbidity curtain.

Flow will not be allowed through the temporary water diversion until all erosion control measures are in place for the CWB pipe and the ground is stabilized for flow.

Step 2: Install Culvert

The precast box culvert will be installed in two phases. It will be installed from the downstream side to the upstream side:

1. Install both the downstream and upstream turbidity curtains; the curtain should prevent fines from entering the upstream opening of the CWB and from entering the stream downstream of the site.
2. Install the downstream and upstream sand bag cofferdams; the cofferdams should be located within the areas confined by the turbidity curtains.
3. Install the dewatering sump pump and connect it to a sediment basin located either on the upstream or downstream side of the roadway. The basin should be located a minimum of 20-feet from a designated wetland.
4. Connect the dewatering sump pump to the sediment basin and dewater the site confined within the two cofferdams.
5. Use Alternating two-way traffic patterns with temporary signals to maintain traffic over the upstream side of the roadway. If necessary, temporary portable concrete barrier will be used to provide separation between the alternating two-way traffic and the work area.
6. Construct the downstream side of the proposed culvert. Grade a 2.0-foot thick layer of streambed type material within the box to mimic the existing brook.
7. Construct and compact the roadway located over the downstream side of the box culvert (selects only).
8. Shift traffic to the downstream side of the roadway and continue to use alternating two-way traffic patterns with temporary signals to maintain traffic over the downstream side of the culvert. If necessary, portable concrete barrier will be used to provide separation between the alternating two-way traffic and the work area.
9. Construct the upstream side of the proposed box culvert. Grade a 2-foot thick layer of streambed type material within the box to mimic the existing brook.
10. Construct and compact the roadway located over the upstream side of the box culvert (selects only).
11. Once all permanent erosion control measures are in place, remove both the upstream and downstream cofferdams and remove the upstream and downstream turbidity curtains.
12. Using flaggers, remove the portable concrete barrier (if installed) and the temporary signals.

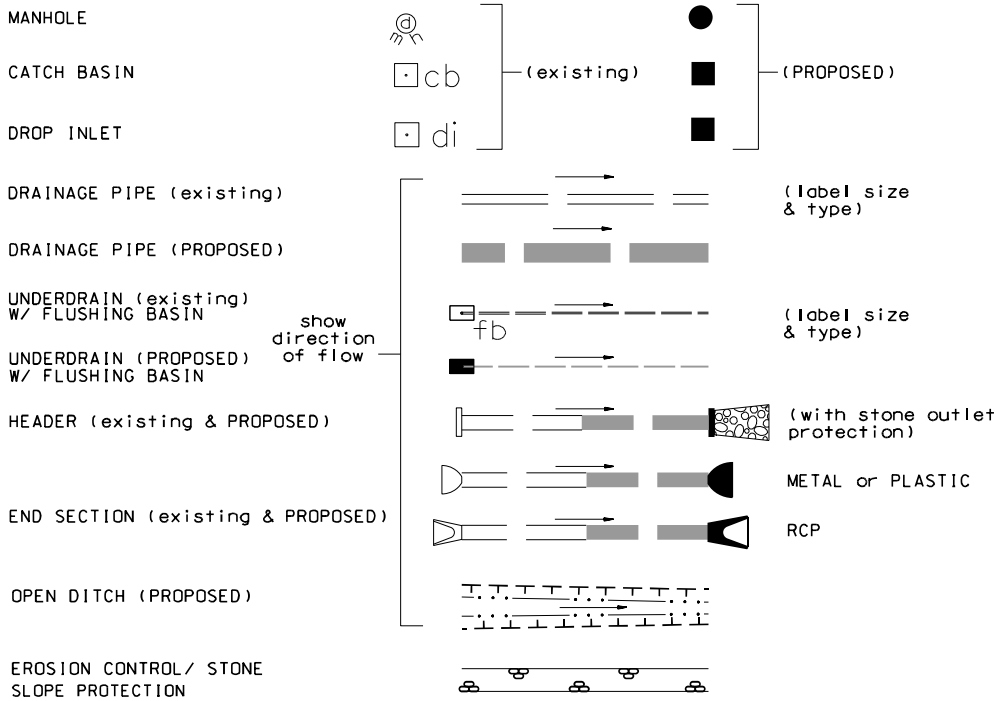
Flow will not be allowed through the new culvert until all permanent erosion control measures are in place and the site is stabilized for flow.

Step 3: Remove Water Diversion Structure and return site to original conditions

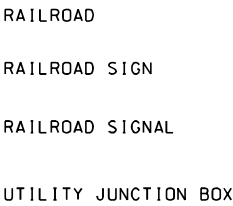
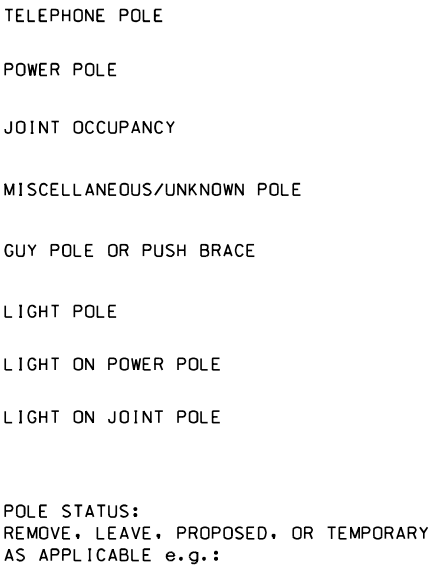
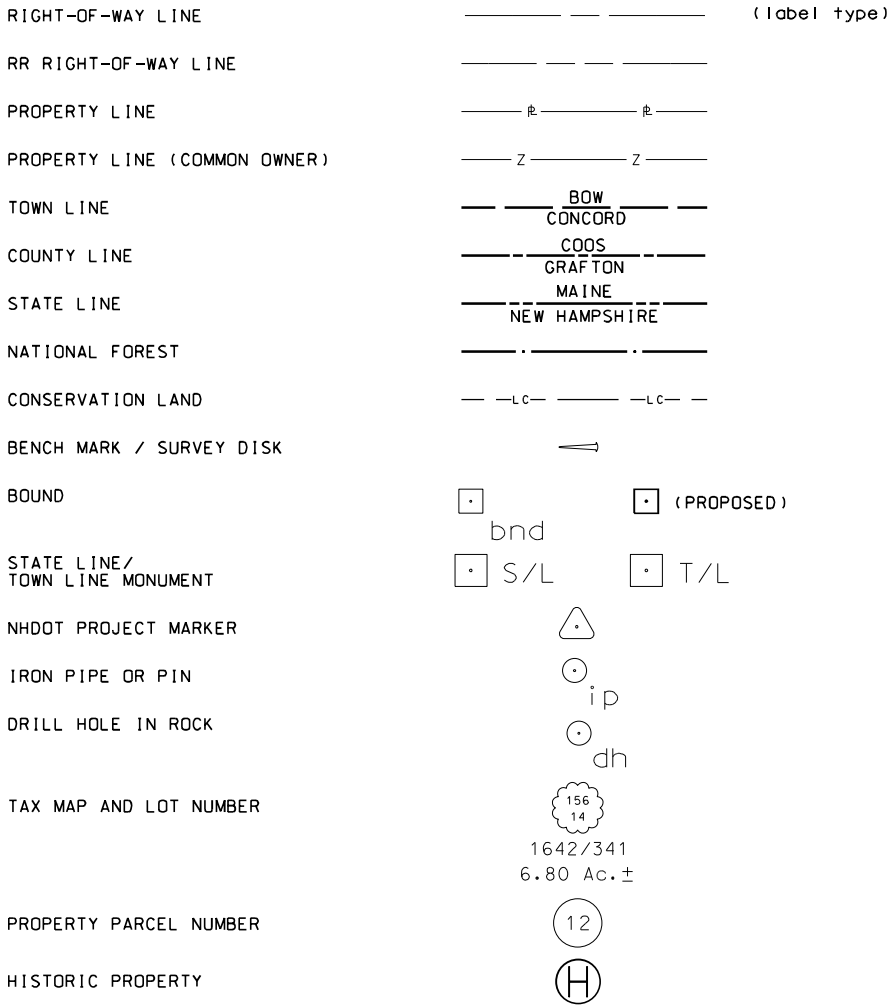
1. Install a turbidity curtain on the upstream and on the downstream side of the CWB pipe; the curtains should be placed to prevent any fines from entering into the newly installed culvert or from entering the stream downstream of the site.
2. Install a sand bag cofferdam, to dewater the site, on the upstream side and on the downstream side of the CWB pipe within the areas contained by the turbidity curtains.
3. Place a sediment basin on the upstream side of the roadway or on the downstream side of the roadway; locate the basins a minimum of 20-feet from any delineated wetland.
4. Connect a dewatering sump pump to the sediment basin and dewater the site.
5. Remove the water diversion structure pipe using alternating two-way traffic patterns with flaggers; remove the pipe from the downstream side to the upstream side.
6. Once the pipe is fully removed, rebuild the roadway selects.
7. Remove the sump pump, both sand bag cofferdam, and both turbidity curtains in that order.
8. Pave the roadway.
9. Install guardrail between the roadway and the downstream pond.

All erosion control measures, installed at the inception of the project, will be maintained until the site has returned to its original conditions.

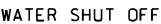
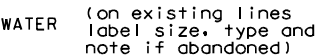
DRAINAGE



BOUNDARIES / RIGHT-OF-WAY



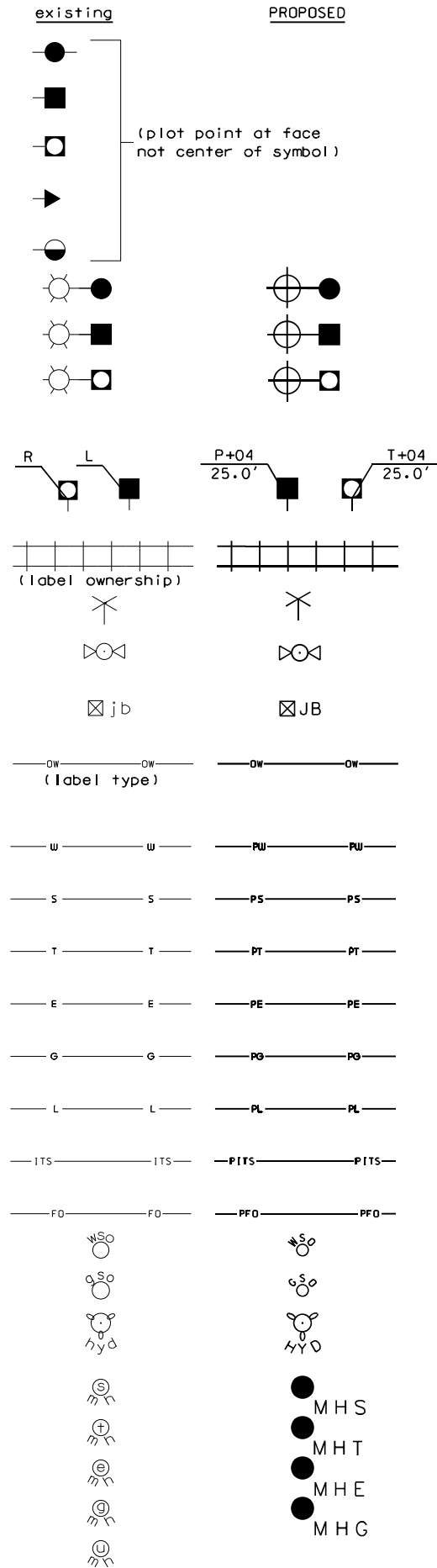
UNDERGROUND UTILITIES



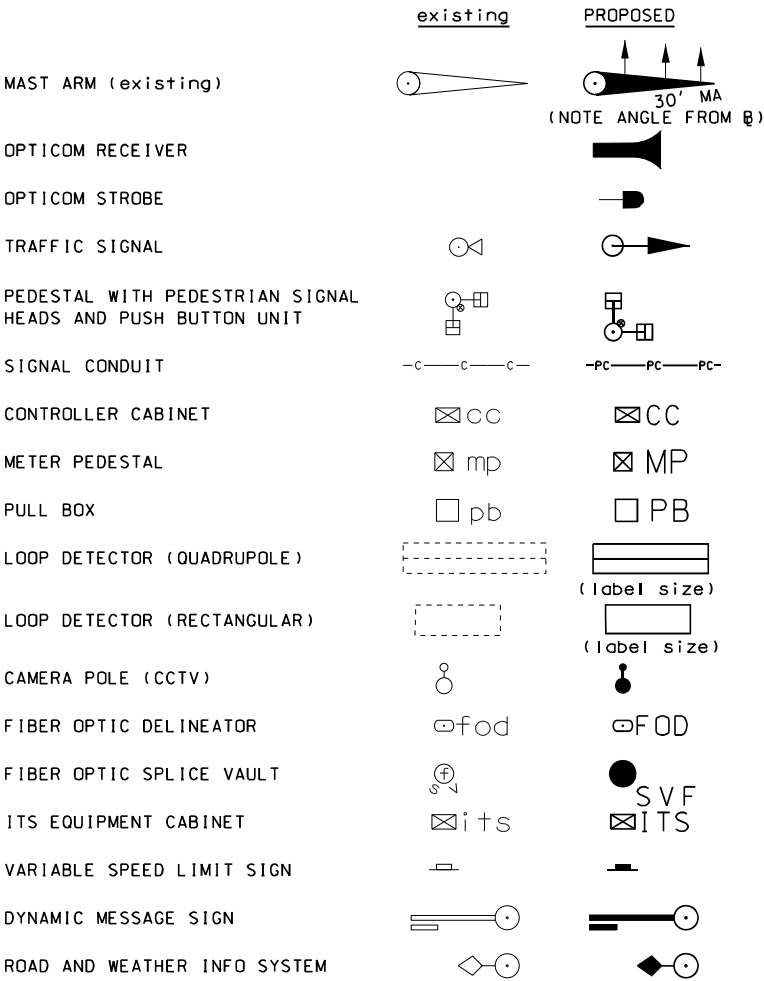
MANHOLES



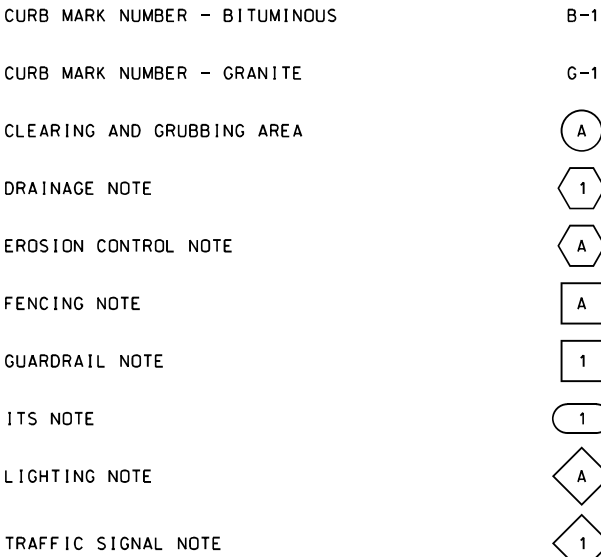
UTILITIES



TRAFFIC SIGNALS / ITS



CONSTRUCTION NOTES



STATE OF NEW HAMPSHIRE				
Standards				
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN				
STANDARD SYMBOLS				
REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
9-1-2016	stdsyml_2		1	2

GENERAL

EDGE OF PAVEMENT			
TRAVELED WAY			
DRIVEWAYS			
BUILDINGS			
FOUNDATION			
LEACH FIELD			
BRIDGE CROSSINGS			
STEPS AND WALK			
INTERMITTENT WATER COURSE			
SHORE LINE			
POTENTIAL WET AREA SYMBOL			
BRUSH OR WOODS LINE			
TREES (PLANS)			
TREE OR STUMP (CROSS-SECTIONS)			
HEDGE			
MONITORING WELL			
WELL			
FLAG POLE			

ORIGINAL GROUND (TYPICALS)	
ROCK OUTCROP	
ROCK LINE (TYPICALS & SECTIONS ONLY)	
GUARDRAIL (label type)	
JERSEY BARRIER	
CURB (LABEL TYPE)	
STONE WALL	
RETAINING WALL (LABEL TYPE)	
FENCE (LABEL TYPE)	
SIGNS	
GAS PUMP	
FUEL TANK (ABOVE GROUND)	
STORAGE TANK FILLER CAP	
SEPTIC TANK	
GRAVE	
MAILBOX	
VENT PIPE	
SATELLITE DISH ANTENNA	
PHONE	
GROUND LIGHT/LAMP POST	
BORING LOCATION	
TEST PIT	
INTERSTATE NUMBERED HIGHWAY	
UNITED STATES NUMBERED HIGHWAY	
STATE NUMBERED HIGHWAY	

SHORELAND - WETLAND

WETLAND DESIGNATION AND TYPE	
DELINEATED WETLAND	
ORDINARY HIGH WATER	
TOP OF BANK	
TOP OF BANK & ORDINARY HIGH WATER	
NORMAL HIGH WATER	
WIDTH AT BANK FULL	
PRIME WETLAND	
PRIME WETLAND 100' BUFFER	
NON-JURISDICTIONAL DRAINAGE AREA	
COWARDIN DISTINCTION LINE	
TIDAL BUFFER ZONE	
DEVELOPED TIDAL BUFFER ZONE	
HIGHEST OBSERVABLE TIDE LINE	
MEAN HIGH WATER	
MEAN LOW WATER	
VERNAL POOL	
SPECIAL AQUATIC SITE	
REFERENCE LINE	
WATER FRONT BUFFER	
NATURAL WOODLAND BUFFER	
PROTECTED SHORELAND	
INVASIVE SPECIES LABEL	
INVASIVE SPECIES	

FLOODPLAIN / FLOODWAY

500 YEAR FLOODPLAIN BOUNDARY	
100 YEAR FLOODPLAIN BOUNDARY	
FLOODWAY	

ENGINEERING

CONSTRUCTION BASELINE	
PC, PT, POT (ON CONST BASELINE)	
PI (IN CONSTRUCTION BASELINES)	
INTERSECTION OR EQUATION OF TWO LINES	
ORIGINAL GROUND LINE (PROFILES AND CROSS-SECTIONS)	
PROFILE GRADE LINE (PROFILES AND CROSS-SECTIONS)	
CLEARING LINE	
SLOPE LINE	
SLOPE LINE (FILL)	
SLOPE LINE (CUT)	
PROFILES AND CROSS SECTIONS:	
ORIGINAL GROUND ELEVATION (LEFT)	
FINISHED GRADE ELEVATION (RIGHT)	

STATE OF NEW HAMPSHIRE				
Standards				
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN				
STANDARD SYMBOLS				
REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
11-21-2014	stdsyml_2		2	2

NHDOT STANDARD SYMBOLS SHEETS ARE ATTACHED TO THE PERMIT APPLICATION

WETLANDS DELINEATED BY:
SARAH LARGE & DEIDRA BENJAMIN
ON 06/01/2021

LEGEND

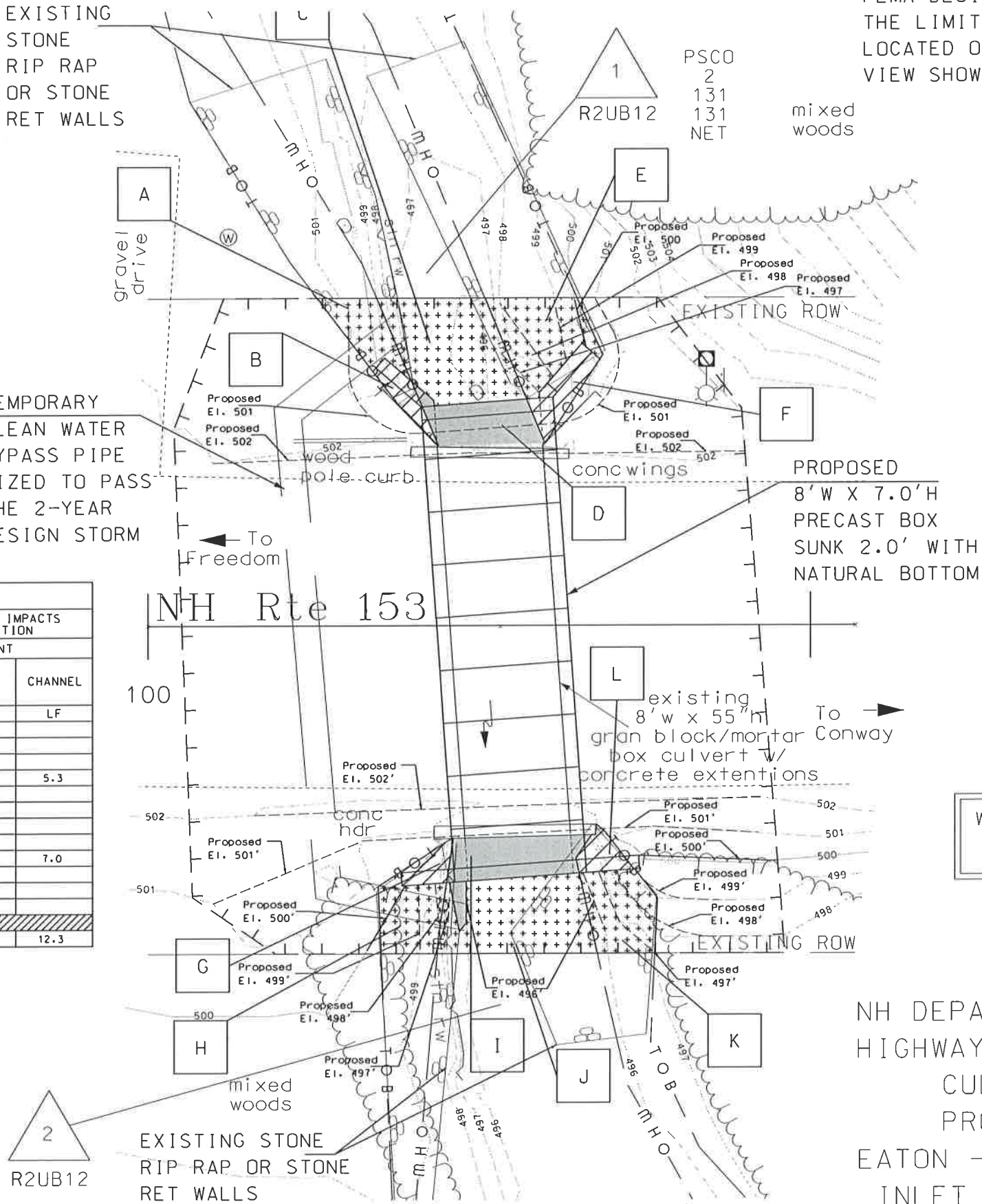
TYPE OF WETLAND IMPACT	SHADING/HATCHING	#	WETLAND DESIGNATION NUMBER
NEW HAMPSHIRE WETLANDS BUREAU (PERMANENT NON-WETLAND)		#	WETLAND IMPACT LOCATION
NEW HAMPSHIRE WETLANDS BUREAU & ARMY CORP OF ENGINEERS (PERMANENT WETLAND)		#	WETLAND MITIGATION AREA
TEMPORARY IMPACTS			MITIGATION

WETLAND IMPACT SUMMARY											
WETLAND NUMBER	WETLAND CLASS- IFICATION	LOCATION	AREA IMPACTS						LINEAR STREAM IMPACTS FOR MITIGATION		
			PERMANENT				TEMPORARY		PERMANENT		
			N.H.W.B. (NON-WETLAND)		N.H.W.B. & A.C.O.E. (WETLAND)				BANK LEFT	BANK RIGHT	CHANNEL
			SF	LF	SF	LF	SF	LF			
	BANK	A					18.6	6.8			
	BANK	B	9.0	5.3					5.3		
1	R2UB12	C					63.3	8.7			
1	R2UB12	O			27.0	5.3					5.3
	BANK	E					38.6	8.2			
	BANK	F	15.5	3.6						3.6	
	BANK	G	7.9	3.3					3.3		
	BANK	H					25.1	5.4			
2	R2UB12	I			34.0	7.0					7.0
2	R2UB12	J					60.4	5.8			
	BANK	K					30.4	6.2			
	BANK	L	8.6	3.6						3.6	
TOTAL			41.0	15.8	61.0	12.3	236.4	41.1	8.6	7.2	12.3

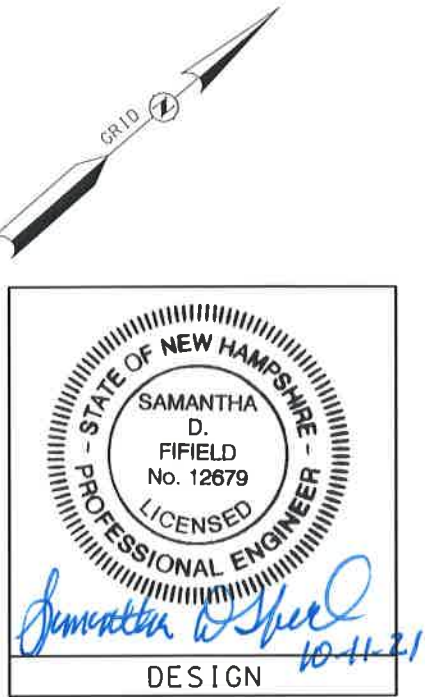
PERMANENT IMPACTS: 102.0 SF
TEMPORARY IMPACTS: 236.4 SF
TOTAL IMPACTS: 338.4 SF



SCALE IN FEET



IMPACTS SHOWN ARE LOCATED WITHIN THE FEMA DESIGNATED 100-YEAR FLOODPLAIN. THE LIMITS OF THE FLOODPLAIN ARE LOCATED OUTSIDE OF THE SITE PLAN VIEW SHOWN ON THIS SHEET.



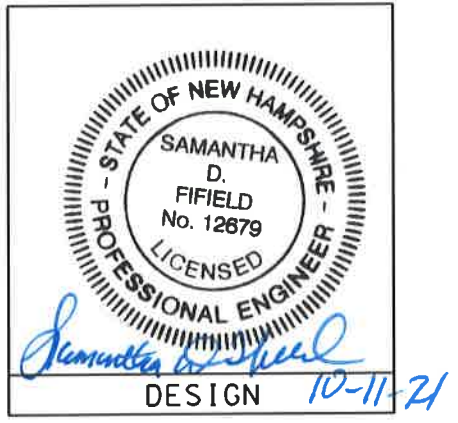
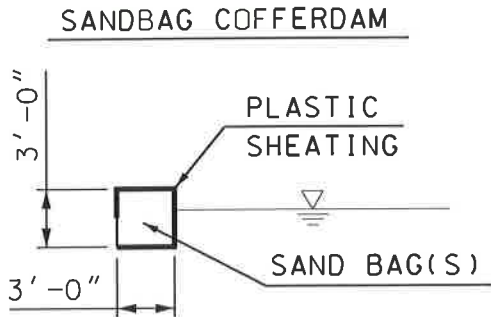
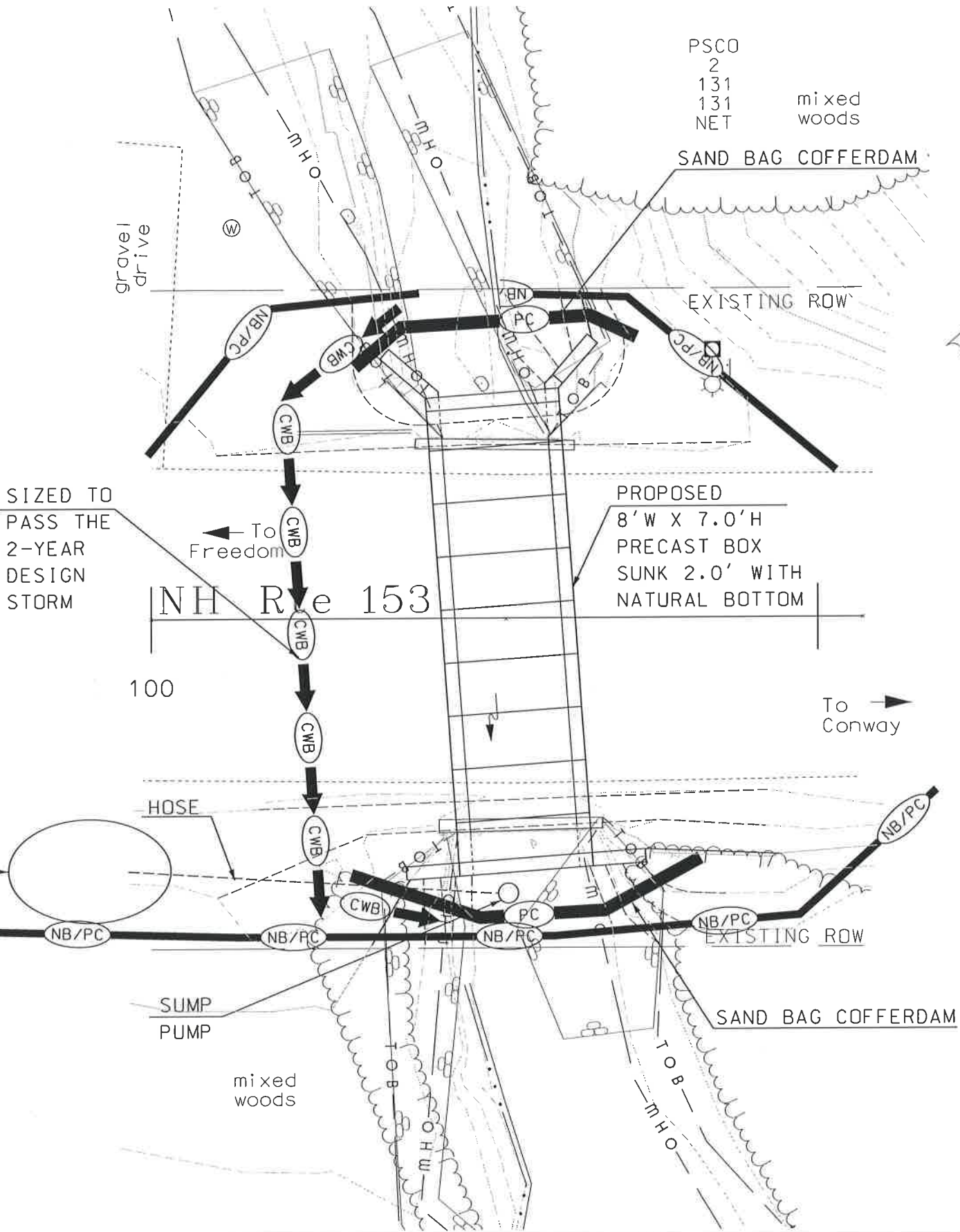
WETLAND IMPACT PLANS
DATE 10-11-2021

NH DEPARTMENT OF TRANSPORTATION
HIGHWAY MAINTENANCE DISTRICT 3
CULVERT REPLACEMENT
PROJECT 2020-M303-1
EATON - NH ROUTE 153 OVER THE
INLET BROOK TO CRYSTAL LAKE

NHDOT STANDARD SYMBOLS SHEETS ARE ATTACHED TO THE PERMIT APPLICATION

WETLANDS DELINEATED BY:
SARAH LARGE & DEIDRA BENJAMIN
ON 06-01-2021

EROSION CONTROL PLAN LEGEND	
	PERIMETER CONTROL
	SILT FENCE
	EROSION CONTROL MIX BERM
	EROSION CONTROL MIX SOX
	TURBIDITY CURTAIN
	SHEET PILE
	COFFER DAM
	NATURAL BUFFER/PERIMETER CONTROL
	SILT FENCE
	EROSION CONTROL MIX BERM
	EROSION CONTROL MIX SOX
	TURBIDITY CURTAIN
	SHEET PILE
	COFFER DAM
	CHANNEL PROTECTION
	STONE CHECK DAMS
	STRAW WATTLES
	CHANNEL MATTING
	CLASS D EROSION STONE
	CLASS C STONE
	CLEAN WATER BYPASS
	PUMP THROUGH PIPE
	DRAIN THROUGH PIPE OR CHANNEL



EROSION CONTROL PLANS
DATE 10-11-2021

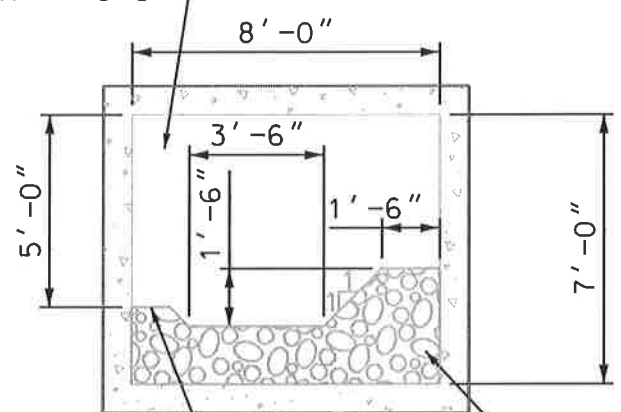
NH DEPARTMENT OF TRANSPORTATION
HIGHWAY MAINTENANCE DISTRICT 3
CULVERT REPLACEMENT
PROJECT 2020-M303-1

EATON - NH ROUTE 153 OVER THE
INLET BROOK TO CRYSTAL LAKE

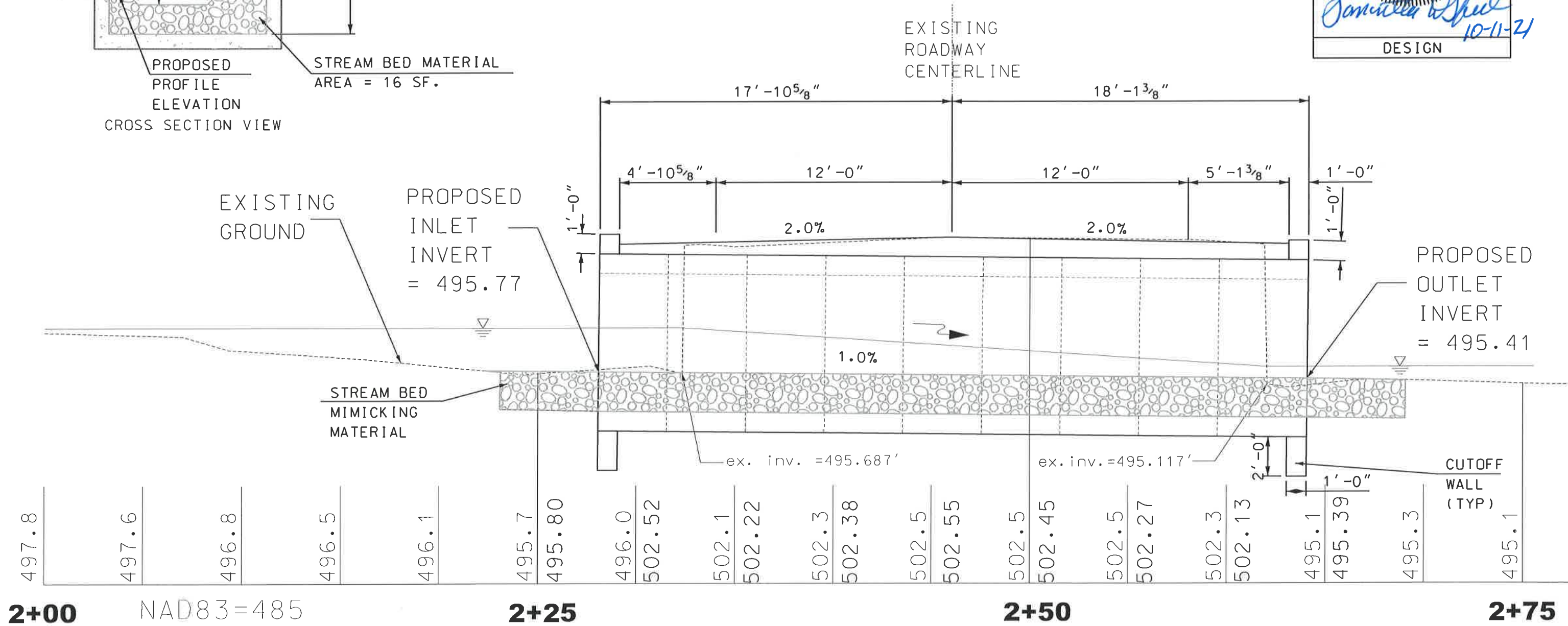
EATON 1832-H-1 (2020-M303-1)

NH 153 OVER NO NAME BROOK TO CRYSTAL LAKE

HYDRAULIC
OPENING
AREA = 40 SF.

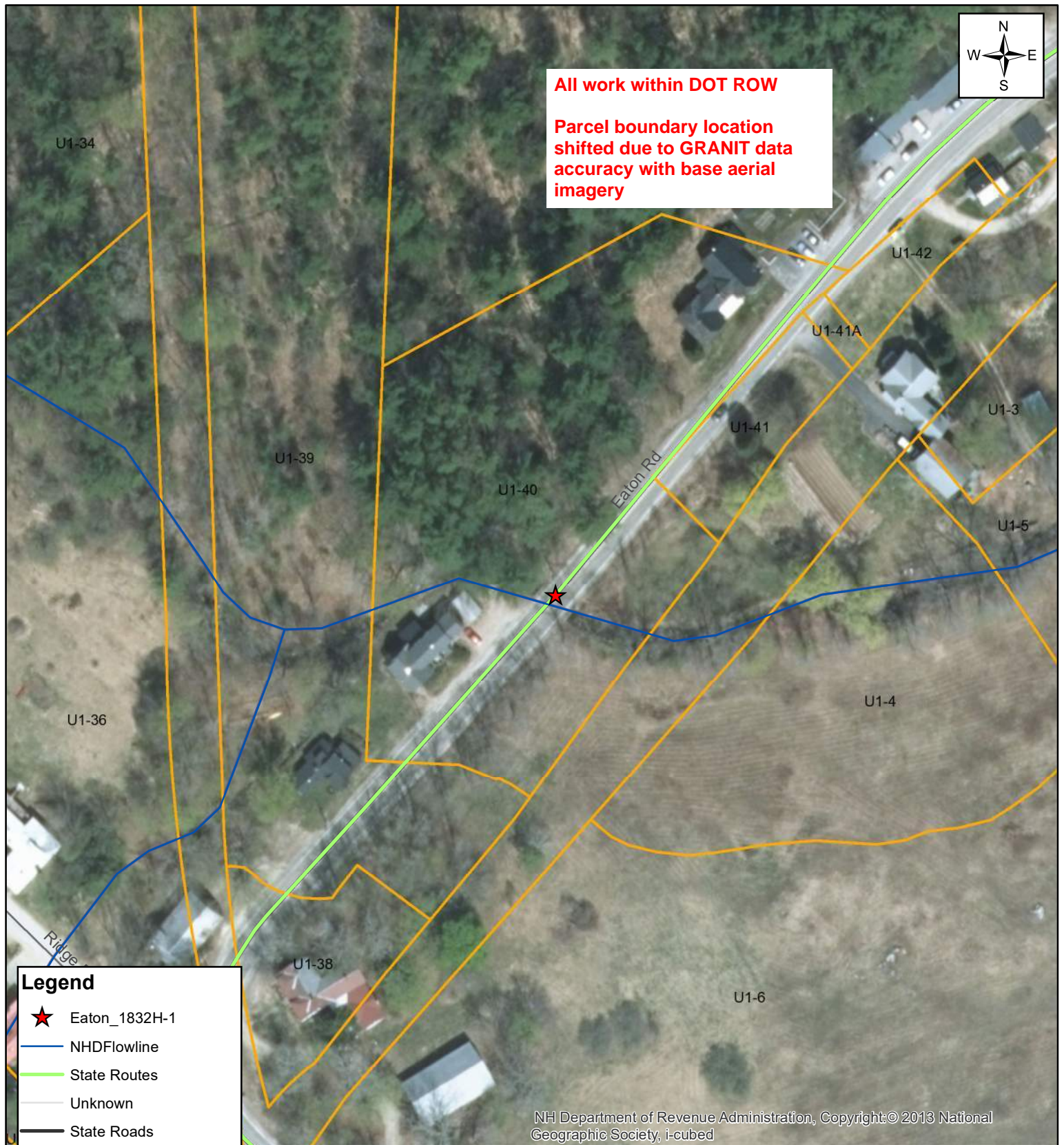


THE PROPOSED CROSSING'S TOTAL OPEN AREA SHALL BE EQUAL TO 40 SF. THE MATERIAL USED TO FILL THE INVERT OF THE PROPOSED CULVERT SHALL BE STOCKPILED MATERIALS SALVAGED FROM WITHIN THE EXISTING CULVERT CROSSING. IF EXCESS MATERIAL IS REQUIRED, IT SHALL BE GRADED SIMILARLY TO THE GRADING NOTED IN SECTION 8 OF THE STREAM CROSSING WORKSHEET COMPLETED FOR THIS LOCATION. THE NATURAL BED MATERIAL SHALL HAVE A CROSS SECTIONAL AREA EQUAL TO 16 SF AND SHALL BE GRADED TO ALLOW FOR WILDLIFE CROSSINGS AT ELEVATIONS ABOVE NORMAL CHANNEL FLOW.



PROFILE VIEW

Eaton, Project #1832-H-1



Legend

- ★ Eaton_1832H-1
- NHDFlowline
- State Routes
- Unknown
- State Roads
- Federal Roads
- Recreation Roads
- Local Roads
- Not Maintained (Class 6)
- Private Roads
- Parcels - polygons

Map depicting culvert replacement project #1832H-1 which carries NH 153 over an un-named tributary to Crystal Lake.

Map created by: Arin Mills on 3/22/2021

Source: S:\Environment\PROJECTS\Eaton\1832-H-1

0 50 100 200 Feet

1:1,200

New Hampshire
DOT
Department of Transportation



U.S. Department of
Homeland Security

United States
Coast Guard



Commander (dpb)
First Coast Guard District

One South Street
Battery Park Building
New York, NY 10004-1466
Staff Symbol: dpb
Phone: (212) 514-4330
Email: Dale.K.Lewis2@uscg.mil

April 2, 2021

NH Department of Transportation
Bureau of Environment
Attn: Ms. Arin Mills
Environmental Manager
7 Hazen Drive
Concord, NH 03302
Arin.j.mills@dot.nh.gov

via e-mail

Re: NV-1086: US Route 3 over Unnamed Stream; NH Route 153(culvert) over Unnamed Stream; NH Route 153 over Unnamed Stream; River Road over Great Brook

Dear Ms. Mills,

This is in response to your letter dated April 1, 2021 and corresponding information requesting whether the Coast Guard will require permits for the referenced bridge projects. We have examined the proposed project areas with regard to their status as navigable waterways of the United States for purposes of Coast Guard bridge jurisdiction.

Our examination indicates that there is no sufficient factual support for concluding that the Unnamed Stream, Thornton, NH, the Unnamed Stream, Eaton, NH, the Unnamed Stream, Wakefield, NH, and Great Brook, Bridgewater, NH at the project locations, have current or historic navigation occurring on these waters of the United States. Since this is the case, Coast Guard bridge permits or exemptions will not be required for the referenced bridge projects.

If you have any questions feel free to contact this office at the number above.

Sincerely,

D. A. Fisher
Bridge Program Manager
U.S. Coast Guard
By direction

E-Copy: 1) USCG Sector Northern New England, Waterways
2) USACE, New England Division, Navigation Section

Mills, Arin

From: Mills, Arin <Arin.J.Mills@dot.nh.gov>
Sent: Thursday, April 1, 2021 11:55 AM
To: Fisher, Donna A CIV
Cc: Lewis, Dale K CIV; Stieb, Jeffrey D CIV
Subject: [Non-DoD Source] USCG Review- Culvert Work NHDOT District 3
Attachments: Wakefield_Topo.pdf; Wakefield_2019-M312-1.zip; Thornton_2020-M325-1_Topo.pdf; Thornton_2020-M324-4.zip; Eaton_1832H-1.zip; Loc Map Eaton NH 153 over the inlet to Crystal Lake Culvert.pdf; Bridgewater_2020-M324-02_Topo.pdf; Bridgewater_2020-M324-2.zip

Hello Donna,

NHDOT is proposing to conduct repair/replacement to the various stream crossings in District 3 and requests your review. To streamline the review, I have included multiple project locations with details below on each site. I have further provided a location map for each, as well as GIS data to assist with your review. Please review from your agency perspective and let me know if you have any concerns for any of the projects as described below. Each of these projects intends to be constructed by District forces, and will very likely require a wetland permit from NHDES to conduct the work.

Thornton, 2020-M325-1: Repair an existing 36" RCP which carries US 3 over an un-named stream in Thornton. Work will include repairs to address invert deterioration with possible slip-lining.

Eaton, 1832-H-1: Replacement of the existing stone culvert which carries NH 153 over an un-named stream which is a tributary to Crystal Lake.

Wakefield, 2019-M312-1: Replacement of existing CMP which carries NH 153 over an un-named stream which is a tributary to the south end of Belleau Lake in Wakefield. Work will also replacement of headwalls and address beaver activity in the area.

Bridgewater, 2020-M324-2: Repair and existing twin 36" RCP which carries River Road over Great Brook in Bridgewater. A design is still in development, but may include possible slip-lining or possible replacement.

Thanks, and feel free to reach out with any questions.

Arin Mills
Environmental Manager, Operations Management
NH Department of Transportation
Bureau of Environment
7 Hazen Drive, Concord, NH 03302
Ph: (603)271-0187
Arin.j.mills@dot.nh.gov